

1. NAME OF THE MEDICINAL PRODUCT

RINVOQ 15 mg prolonged-release tablets
RINVOQ 30 mg prolonged-release tablets
RINVOQ 45 mg prolonged-release tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

RINVOQ 15 mg prolonged-release tablets

Each prolonged-release tablet contains upadacitinib hemihydrate, equivalent to 15 mg of upadacitinib.

RINVOQ 30 mg prolonged-release tablets

Each prolonged-release tablet contains upadacitinib hemihydrate, equivalent to 30 mg of upadacitinib.

RINVOQ 45 mg prolonged-release tablets

Each prolonged-release tablet contains upadacitinib hemihydrate, equivalent to 45 mg of upadacitinib.

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Prolonged-release tablet

RINVOQ 15 mg prolonged-release tablets

Purple 14 x 8 mm, oblong biconvex prolonged-release tablets imprinted on one side with 'a15'.

RINVOQ 30 mg prolonged-release tablets

Red 14 x 8 mm, oblong biconvex prolonged-release tablets imprinted on one side with 'a30'.

RINVOQ 45 mg prolonged-release tablets

Yellow to mottled yellow 14 x 8 mm, oblong biconvex prolonged-release tablets imprinted on one side with 'a45'.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Rheumatoid arthritis

RINVOQ is indicated for the treatment of moderate to severe active rheumatoid arthritis in adult patients who have responded inadequately to, or who are intolerant to one or more disease-modifying anti-rheumatic drugs (DMARDs). RINVOQ may be used as monotherapy or in combination with methotrexate.

Psoriatic arthritis

RINVOQ is indicated for the treatment of active psoriatic arthritis in adult patients who have responded inadequately to, or who are intolerant to one or more DMARDs. RINVOQ may be used as monotherapy or in combination with methotrexate.

Axial spondyloarthritis

Non-radiographic axial spondyloarthritis (nr-axSpA)

RINVOQ is indicated for the treatment of active non-radiographic axial spondyloarthritis in adult patients with objective signs of inflammation as indicated by elevated C-reactive protein (CRP) and/or magnetic resonance imaging (MRI), who have responded inadequately to nonsteroidal anti-inflammatory drugs (NSAIDs).

Ankylosing spondylitis (AS, radiographic axial spondyloarthritis)

RINVOQ is indicated for the treatment of active ankylosing spondylitis in adult patients who have responded inadequately to conventional therapy.

Giant cell arteritis

RINVOQ is indicated for the treatment of giant cell arteritis in adult patients.

Atopic dermatitis

RINVOQ is indicated for the treatment of moderate to severe atopic dermatitis in adults and adolescents 12 years and older who are candidates for systemic therapy.

Alopecia areata

RINVOQ is indicated for the treatment of severe alopecia areata in adults and adolescents 12 years and older (see section 5.1).

Vitiligo

RINVOQ is indicated for the treatment of non-segmental vitiligo in adults and adolescents 12 years and older who are candidates for systemic therapy.

Ulcerative colitis

RINVOQ is indicated for the treatment of adult patients with moderately to severely active ulcerative colitis who have had an inadequate response, lost response or were intolerant to either conventional therapy or a biologic agent.

Crohn's disease

RINVOQ is indicated for the treatment of adult patients with moderately to severely active Crohn's disease who have had an inadequate response, lost response or were intolerant to either conventional therapy or a biologic agent.

4.2 Posology and method of administration

Treatment with upadacitinib should be initiated and supervised by physicians experienced in the diagnosis and treatment of conditions for which upadacitinib is indicated.

Posology

Rheumatoid arthritis, psoriatic arthritis and axial spondyloarthritis

The recommended dose of upadacitinib is 15 mg once daily.

Consideration should be given to discontinuing treatment in patients with axial spondyloarthritis who have shown no clinical response after 16 weeks of treatment. Some patients with initial partial response may subsequently improve with continued treatment beyond 16 weeks.

Giant cell arteritis

The recommended dose of upadacitinib is 15 mg once daily in combination with a tapering course of corticosteroids. Upadacitinib monotherapy should not be used for the treatment of acute relapses (see section 4.4).

Based upon the chronic nature of giant cell arteritis, upadacitinib 15 mg once daily can be continued as monotherapy following discontinuation of corticosteroids.

Atopic dermatitis

The recommended dose of upadacitinib is 15 mg or 30 mg once daily based on individual patient presentation.

- A dose of 15 mg is recommended for patients at higher risk of venous thromboembolism (VTE), major adverse cardiovascular events (MACE) and malignancy (see section 4.4).
- A dose of 30 mg once daily may be appropriate for patients with high disease burden who are not at higher risk of VTE, MACE and malignancy (see section 4.4) or patients with an inadequate response to 15 mg once daily.
- In adolescents (12 to 17 years of age) weighing at least 30 kg, a dose of 15 mg is recommended. If the patient does not respond adequately to 15 mg once daily, the dose can be increased to 30 mg once daily.
- The lowest effective dose to maintain response should be used.

For patients 65 years of age and older, the recommended dose is 15 mg once daily (see section 4.4).

Concomitant topical therapies

Upadacitinib can be used with or without topical corticosteroids. Topical calcineurin inhibitors may be used for sensitive areas such as the face, neck, and intertriginous and genital areas.

Consideration should be given to discontinuing upadacitinib treatment in any patient who shows no evidence of therapeutic benefit after 12 weeks of treatment.

Alopecia areata

For adults and adolescent patients 12 years of age and older weighing at least 30 kg, the recommended dose of upadacitinib is 15 mg or 30 mg once daily based on individual patient presentation.

- A dose of 30 mg once daily may be appropriate for patients with high disease burden or patients with an inadequate response to 15 mg once daily.
- The lowest effective dose to maintain response should be used.

For patients 65 years of age and older, the recommended dose is 15 mg once daily (see section 4.4).

Efficacy data are available for 24 weeks of treatment. The benefit-risk of treatment should be re-assessed at regular intervals on an individual basis.

Vitiligo

The recommended dose of upadacitinib is 15 mg once daily for adults and adolescents 12 years of age and older weighing at least 30 kg.

Consideration should be given to discontinuing upadacitinib treatment in any patient who shows no evidence of therapeutic benefit after 48 weeks of treatment.

Ulcerative colitis

Induction

The recommended induction dose of upadacitinib is 45 mg once daily for 8 weeks. For patients who do not achieve adequate therapeutic benefit by week 8, upadacitinib 45 mg once daily may be continued for an additional 8-week period (see section 5.1). Upadacitinib should be discontinued in any patient who shows no evidence of therapeutic benefit by week 16.

Maintenance

The recommended maintenance dose of upadacitinib is 15 mg or 30 mg once daily based on individual patient presentation:

- A dose of 15 mg is recommended for patients at higher risk of VTE, MACE and malignancy (see section 4.4).
- A dose of 30 mg once daily may be appropriate for some patients, such as those with high disease burden or requiring 16-week induction treatment who are not at higher risk of VTE, MACE and malignancy (see section 4.4) or who do not show adequate therapeutic benefit to 15 mg once daily.
- The lowest effective dose to maintain response should be used.

For patients 65 years of age and older, the recommended dose is 15 mg once daily (see section 4.4).

In patients who have responded to treatment with upadacitinib, corticosteroids may be reduced and/or discontinued in accordance with standard of care.

Crohn's disease

Induction

The recommended induction dose of upadacitinib is 45 mg once daily for 12 weeks. For patients who have not achieved adequate therapeutic benefit after the initial 12-week induction, prolonged induction for an additional 12 weeks with a dose of 30 mg once daily may be considered. For these patients, upadacitinib should be discontinued if there is no evidence of therapeutic benefit after 24 weeks of treatment.

Maintenance

The recommended maintenance dose of upadacitinib is 15 mg or 30 mg once daily based on individual patient presentation:

- A dose of 15 mg is recommended for patients at higher risk of VTE, MACE and malignancy (see section 4.4).
- A dose of 30 mg once daily may be appropriate for patients with high disease burden who are not at higher risk of VTE, MACE and malignancy (see section 4.4) or who do not show adequate therapeutic benefit to 15 mg once daily.
- The lowest effective dose to maintain response should be used.

For patients 65 years of age and older, the recommended maintenance dose is 15 mg once daily (see section 4.4).

In patients who have responded to treatment with upadacitinib, corticosteroids may be reduced and/or discontinued in accordance with standard of care.

Interactions

For patients with ulcerative colitis and Crohn's disease receiving strong inhibitors of cytochrome P450 (CYP) 3A4 (e.g., ketoconazole, clarithromycin), the recommended induction dose is 30 mg once daily and the recommended maintenance dose is 15 mg once daily (see section 4.5).

Dose initiation

Treatment should not be initiated in patients with an absolute lymphocyte count (ALC) that is $< 0.5 \times 10^9$ cells/L, an absolute neutrophil count (ANC) that is $< 1 \times 10^9$ cells/L or who have haemoglobin (Hb) levels that are < 8 g/dL (see sections 4.4 and 4.8).

Dose interruption

Treatment should be interrupted if a patient develops a serious infection until the infection is controlled.

Interruption of dosing may be needed for management of laboratory abnormalities as described in Table 1.

Table 1 Laboratory measures and monitoring guidance

Laboratory measure	Action	Monitoring guidance
Absolute Neutrophil Count (ANC)	Treatment should be interrupted if ANC is $< 1 \times 10^9$ cells/L and may be restarted once ANC returns above this value	Evaluate at baseline and then no later than 12 weeks after initiation of treatment. Thereafter evaluate according to individual patient management.
Absolute Lymphocyte Count (ALC)	Treatment should be interrupted if ALC is $< 0.5 \times 10^9$ cells/L and may be restarted once ALC returns above this value	
Haemoglobin (Hb)	Treatment should be interrupted if Hb is < 8 g/dL and may be restarted once Hb returns above this value	
Hepatic transaminases	Treatment should be temporarily interrupted if drug-induced liver injury is suspected	Evaluate at baseline and thereafter according to routine patient management.
Lipids	Patients should be managed according to international clinical guidelines for hyperlipidaemia	Evaluate 12 weeks after initiation of treatment and thereafter according to international clinical guidelines for hyperlipidaemia

Special populations

Elderly

Rheumatoid arthritis, psoriatic arthritis, and axial spondyloarthritis

There are limited data in patients 75 years of age and older (see section 4.4).

Atopic dermatitis

For atopic dermatitis, doses higher than 15 mg once daily are not recommended in patients 65 years of age and older (see sections 4.4 and 4.8).

Alopecia areata

The safety and efficacy of upadacitinib in patients 65 years of age and older have not yet been established (see section 4.4).

Vitiligo

There are limited data in patients 65 years of age and older (see sections 4.4 and 4.8).

Ulcerative colitis and Crohn's disease

For ulcerative colitis and Crohn's disease, doses higher than 15 mg once daily for maintenance therapy are not recommended in patients 65 years of age and older (see sections 4.4 and 4.8). The safety and efficacy of upadacitinib in patients 75 years of age and older have not yet been established.

Renal impairment

No dose adjustment is required in patients with mild or moderate renal impairment. There are limited data on the use of upadacitinib in subjects with severe renal impairment (see section 5.2). Upadacitinib should be used with caution in patients with severe renal impairment as described in Table 2. The use of upadacitinib has not been studied in subjects with end stage renal disease and is therefore not recommended for use in these patients.

Table 2 Recommended dose for severe renal impairment^a

Therapeutic indication	Recommended once daily dose
Rheumatoid arthritis, psoriatic arthritis, axial spondyloarthritis, giant cell arteritis, atopic dermatitis, alopecia areata and vitiligo	15 mg
Ulcerative colitis, Crohn's disease	Induction: 30 mg
	Maintenance: 15 mg
^a estimated glomerular filtration rate (eGFR) 15 to < 30 ml/min/1.73m ²	

Hepatic impairment

No dose adjustment is required in patients with mild (Child-Pugh A) or moderate (Child-Pugh B) hepatic impairment (see section 5.2). Upadacitinib should not be used in patients with severe (Child-Pugh C) hepatic impairment (see section 4.3).

Paediatric population

The safety and efficacy of RINVOQ in children with atopic dermatitis, alopecia areata or vitiligo below the age of 12 years have not been established. No data are available.

The safety and efficacy of RINVOQ in children and adolescents with rheumatoid arthritis, psoriatic arthritis, axial spondyloarthritis, ulcerative colitis, or Crohn's disease, aged 0 to less than 18 years have not yet been established. No data are available.

There is no relevant use of RINVOQ in the paediatric population in the indication giant cell arteritis.

Method of administration

RINVOQ is to be taken orally once daily with or without food and may be taken at any time of the day. Tablets should be swallowed whole and should not be split, crushed, or chewed in order to ensure the entire dose is delivered correctly.

4.3 Contraindications

- Hypersensitivity to the active substance or to any of the excipients listed in section 6.1.
- Active tuberculosis (TB) or active serious infections (see section 4.4).
- Severe hepatic impairment (see section 4.2).
- Pregnancy (see section 4.6).

4.4 Special warnings and precautions for use

Upadacitinib should only be used if no suitable treatment alternatives are available in patients:

- 65 years of age and older;
- patients with history of atherosclerotic cardiovascular disease or other cardiovascular risk factors (such as current or past long-time smokers);
- patients with malignancy risk factors (e.g. current malignancy or history of malignancy)

Use in patients 65 years of age and older

Considering the increased risk of MACE, malignancies, serious infections, and all-cause mortality in patients 65 years of age and older, as observed in a large randomised study of tofacitinib (another Janus Kinase (JAK) inhibitor), upadacitinib should only be used in these patients if no suitable treatment alternatives are available.

In patients 65 years of age and older, there is an increased risk of adverse reactions with upadacitinib 30 mg once daily. Consequently, the recommended dose for long-term use in this patient population is 15 mg once daily (see sections 4.2 and 4.8).

Immunosuppressive medicinal products

Combination with other potent immunosuppressants such as azathioprine, 6-mercaptopurine, ciclosporin, tacrolimus, and biologic DMARDs or other JAK inhibitors has not been evaluated in clinical studies and is not recommended as a risk of additive immunosuppression cannot be excluded.

Serious infections

Serious and sometimes fatal infections have been reported in patients receiving upadacitinib. The most frequent serious infections reported with upadacitinib included pneumonia (see section 4.8) and cellulitis. Cases of bacterial meningitis and sepsis have been reported in patients receiving upadacitinib. Among opportunistic infections, tuberculosis, multidermatomal herpes zoster, oral/oesophageal candidiasis, and cryptococcosis were reported with upadacitinib.

Upadacitinib should not be initiated in patients with an active, serious infection, including localised infections (see section 4.3).

Consider the risks and benefits of treatment prior to initiating upadacitinib in patients:

- with chronic or recurrent infection
- who have been exposed to tuberculosis
- with a history of a serious or an opportunistic infection
- who have resided or travelled in areas of endemic tuberculosis or endemic mycoses; or
- with underlying conditions that may predispose them to infection.

Patients should be closely monitored for the development of signs and symptoms of infection during and after treatment with upadacitinib. Upadacitinib therapy should be interrupted if a patient develops a serious or opportunistic infection. A patient who develops a new infection during treatment with upadacitinib should undergo prompt and complete diagnostic testing appropriate for an immunocompromised patient; appropriate antimicrobial therapy should be initiated, the patient should be closely monitored, and upadacitinib therapy should be interrupted if the patient is not responding to antimicrobial therapy. Upadacitinib therapy may be resumed once the infection is controlled.

A higher rate of serious infections was observed with upadacitinib 30 mg compared to upadacitinib 15 mg.

As there is a higher incidence of infections in the elderly and in the diabetic populations in general, caution should be used when treating the elderly and patients with diabetes. In patients 65 years of age and older, upadacitinib should only be used if no suitable treatment alternatives are available (see section 4.2).

Tuberculosis

Patients should be screened for tuberculosis (TB) before starting upadacitinib therapy. Upadacitinib should not be given to patients with active TB (see section 4.3). Anti-TB therapy should be considered prior to initiation of upadacitinib in patients with previously untreated latent TB or in patients with risk factors for TB infection.

Consultation with a physician with expertise in the treatment of TB is recommended to aid in the decision about whether initiating anti-TB therapy is appropriate for an individual patient.

Patients should be monitored for the development of signs and symptoms of TB, including patients who tested negative for latent TB infection prior to initiating therapy.

Viral reactivation

Viral reactivation, including cases of herpes virus reactivation (e.g., herpes zoster), was reported in clinical studies (see section 4.8). The risk of herpes zoster appears to be higher in Japanese patients treated with upadacitinib. If a patient develops herpes zoster, interruption of upadacitinib therapy should be considered until the episode resolves.

Screening for viral hepatitis and monitoring for reactivation should be performed before starting and during therapy with upadacitinib. Patients who were positive for hepatitis C antibody and hepatitis C virus RNA were excluded from clinical studies. Patients who were positive for hepatitis B surface antigen or hepatitis B virus DNA were excluded from clinical studies. If hepatitis B virus DNA is detected while receiving upadacitinib, a liver specialist should be consulted.

Vaccination

No data are available on the response to vaccination with live vaccines in patients receiving upadacitinib. Use of live, attenuated vaccines during or immediately prior to upadacitinib therapy is not recommended. Prior to initiating upadacitinib treatment, it is recommended that patients be

brought up to date with all immunisations, including prophylactic zoster vaccinations, in agreement with current immunisation guidelines (see section 5.1).

Malignancy

Lymphoma and other malignancies have been reported in patients receiving JAK inhibitors, including upadacitinib.

In a large randomised active-controlled study of tofacitinib (another JAK inhibitor) in rheumatoid arthritis patients 50 years and older with at least one additional cardiovascular risk factor, a higher rate of malignancies, particularly lung cancer, lymphoma and non-melanoma skin cancer (NMSC) was observed with tofacitinib compared to tumour necrosis factor (TNF) inhibitors.

A higher rate of malignancies was observed with upadacitinib 30 mg compared to upadacitinib 15 mg.

In patients 65 years of age and older, patients who are current or past long-time smokers, or with other malignancy risk factors (e.g., current malignancy or history of malignancy), upadacitinib should only be used if no suitable treatment alternatives are available.

Non-melanoma skin cancer (NMSC)

NMSCs have been reported in patients treated with upadacitinib (see section 4.8). A higher rate of NMSC was observed with upadacitinib 30 mg compared to upadacitinib 15 mg. Periodic skin examination is recommended for all patients, particularly those with risk factors for skin cancer.

Haematological abnormalities

Absolute Neutrophil Count (ANC) $< 1 \times 10^9$ cells/L, Absolute Lymphocyte Count (ALC) $< 0.5 \times 10^9$ cells/L and haemoglobin < 8 g/dL were reported in ≤ 1 % of patients in clinical trials (see section 4.8). Treatment should not be initiated, or should be temporarily interrupted, in patients with an ANC $< 1 \times 10^9$ cells/L, ALC $< 0.5 \times 10^9$ cells/L or haemoglobin < 8 g/dL observed during routine patient management (see section 4.2).

Gastrointestinal perforations

Events of diverticulitis and gastrointestinal perforations have been reported in clinical trials and from post-marketing sources (see section 4.8).

Upadacitinib should be used with caution in patients who may be at risk for gastrointestinal perforation (e.g., patients with diverticular disease, a history of diverticulitis, or who are taking nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroids, or opioids). Patients with active Crohn's disease are at increased risk for developing intestinal perforation. Patients presenting with new onset abdominal signs and symptoms should be evaluated promptly for early identification of diverticulitis or gastrointestinal perforation.

Major adverse cardiovascular events

Events of MACE were observed in clinical studies of upadacitinib.

In a large randomised active-controlled study of tofacitinib (another JAK inhibitor) in rheumatoid arthritis patients 50 years and older with at least one additional cardiovascular risk factor, a higher rate of MACE, defined as cardiovascular death, non-fatal myocardial infarction (MI) and non-fatal stroke, was observed with tofacitinib compared to TNF inhibitors.

Therefore, in patients 65 years of age and older, patients who are current or past long-time smokers, and patients with history of atherosclerotic cardiovascular disease or other cardiovascular risk factors, upadacitinib should only be used if no suitable treatment alternatives are available.

Lipids

Treatment with upadacitinib was associated with dose-dependent increases in lipid parameters, including total cholesterol, low-density lipoprotein (LDL) cholesterol, and high-density lipoprotein (HDL) cholesterol (see section 4.8). Elevations in LDL cholesterol decreased to pre-treatment levels in response to statin therapy, although evidence is limited. The effect of these lipid parameter elevations on cardiovascular morbidity and mortality has not been determined (see section 4.2 for monitoring guidance).

Hepatic transaminase elevations

Treatment with upadacitinib was associated with an increased incidence of liver enzyme elevation compared to placebo (see section 4.8).

Hepatic transaminases must be evaluated at baseline and thereafter according to routine patient management. Prompt investigation of the cause of liver enzyme elevation is recommended to identify potential cases of drug-induced liver injury.

If increases in ALT or AST are observed during routine patient management and drug-induced liver injury is suspected, upadacitinib therapy should be interrupted until this diagnosis is excluded.

Venous thromboembolism

Events of deep venous thrombosis (DVT) and pulmonary embolism (PE) were observed in clinical trials for upadacitinib.

In a large randomised active-controlled study of tofacitinib (another JAK inhibitor) in rheumatoid arthritis patients 50 years and older with at least one additional cardiovascular risk factor, a dose-dependent higher rate of VTE including DVT and PE was observed with tofacitinib compared to TNF inhibitors.

In patients with cardiovascular or malignancy risk factors (see also section 4.4 “Major adverse cardiovascular events” and “Malignancy”) upadacitinib should only be used if no suitable treatment alternatives are available.

In patients with known VTE risk factors other than cardiovascular or malignancy risk factors, upadacitinib should be used with caution. VTE risk factors other than cardiovascular or malignancy risk factors include previous VTE, patients undergoing major surgery, immobilisation, use of combined hormonal contraceptives or hormone replacement therapy, and inherited coagulation disorder. Patients should be re-evaluated periodically during upadacitinib treatment to assess for changes in VTE risk. Patients with signs and symptoms of VTE should be promptly evaluated and treatment should be discontinued in patients with suspected VTE, regardless of dose.

Retinal vein occlusion

Retinal vein occlusion has been reported in patients treated with JAK inhibitors, including upadacitinib. Patients should be advised to promptly seek medical care in case they experience symptoms suggestive of retinal vein occlusion.

Hypersensitivity reactions

Serious hypersensitivity reactions such as anaphylaxis and angioedema have been reported in patients receiving upadacitinib. If a clinically significant hypersensitivity reaction occurs, treatment with

upadacitinib must be discontinued and appropriate therapy must be instituted (see sections 4.3 and 4.8).

Hypoglycaemia in patients treated for diabetes

There have been reports of hypoglycaemia following initiation of JAK inhibitors, including upadacitinib, in patients receiving treatment for diabetes. Dose adjustment of anti-diabetic medicinal products may be necessary in the event that hypoglycaemia occurs.

Medication Residue in Stool

Reports of medication residue in stool or ostomy output have occurred in patients taking upadacitinib. Most reports described anatomic (e.g., ileostomy, colostomy, intestinal resection) or functional gastrointestinal conditions with shortened gastrointestinal transit times. Patients should be instructed to contact their healthcare professional if medication residue is observed repeatedly. Patients should be clinically monitored, and alternative treatment should be considered if there is an inadequate therapeutic response.

Giant Cell Arteritis

Upadacitinib monotherapy should not be used for the treatment of acute relapses as efficacy in this setting has not been established. Corticosteroids should be given according to medical judgement and practice guidelines.

4.5 Interaction with other medicinal products and other forms of interaction

Potential for other medicinal products to affect the pharmacokinetics of upadacitinib

Upadacitinib is metabolised mainly by CYP3A4. Therefore, upadacitinib plasma exposures can be affected by medicinal products that strongly inhibit or induce CYP3A4.

Co-administration with CYP3A4 inhibitors

Upadacitinib exposure is increased when co-administered with strong CYP3A4 inhibitors (such as ketoconazole, itraconazole, posaconazole, voriconazole, clarithromycin, and grapefruit). In a clinical study, co-administration of upadacitinib with ketoconazole resulted in 70% and 75% increases in upadacitinib C_{max} and AUC, respectively. Upadacitinib 15 mg once daily should be used with caution in patients receiving chronic treatment with strong CYP3A4 inhibitors. Upadacitinib 30 mg once daily dose is not recommended for patients with atopic dermatitis or alopecia areata receiving chronic treatment with strong CYP3A4 inhibitors. For patients with ulcerative colitis or Crohn's disease using strong CYP3A4 inhibitors, the recommended induction dose is 30 mg once daily and the recommended maintenance dose is 15 mg once daily (see section 4.2). Alternatives to strong CYP3A4 inhibitors should be considered when used in the long-term. Food or drink containing grapefruit should be avoided during treatment with upadacitinib.

Co-administration with CYP3A4 inducers

Upadacitinib exposure is decreased when co-administered with strong CYP3A4 inducers (such as rifampin and phenytoin), which may lead to reduced therapeutic effect of upadacitinib. In a clinical study, co-administration of upadacitinib after multiple doses of rifampicin (strong CYP3A inducer) resulted in approximately 50% and 60% decreases in upadacitinib C_{max} and AUC, respectively. Patients should be monitored for changes in disease activity if upadacitinib is co-administered with strong CYP3A4 inducers.

Methotrexate and pH modifying medicinal products (e.g., antacids or proton pump inhibitors) have no effect on upadacitinib plasma exposures.

Potential for upadacitinib to affect the pharmacokinetics of other medicinal products

Administration of multiple 30 mg or 45 mg once daily doses of upadacitinib to healthy subjects had a limited effect on midazolam (sensitive substrate for CYP3A) plasma exposures (24-26% decrease in midazolam AUC and C_{max}), indicating that upadacitinib 30 mg or 45 mg once daily may have a weak induction effect on CYP3A. In a clinical study, rosuvastatin and atorvastatin AUC were decreased by 33% and 23%, respectively, and rosuvastatin C_{max} was decreased by 23% following the administration of multiple 30 mg once daily doses of upadacitinib to healthy subjects. Upadacitinib had no relevant effect on atorvastatin C_{max} or on plasma exposures of ortho-hydroxyatorvastatin (major active metabolite for atorvastatin). Administration of multiple 45 mg once daily doses of upadacitinib to healthy subjects led to a limited increase in AUC and C_{max} of dextromethorphan (sensitive CYP2D6 substrate) by 30% and 35%, respectively, indicating that upadacitinib 45 mg once daily has a weak inhibitory effect on CYP2D6. No dose adjustment is recommended for CYP3A substrates, CYP2D6 substrates, rosuvastatin or atorvastatin when co-administered with upadacitinib.

Upadacitinib has no relevant effects on plasma exposures of ethinylestradiol, levonorgestrel, methotrexate, or medicinal products that are substrates for metabolism by CYP1A2, CYP2B6, CYP2C9, or CYP2C19.

4.6 Fertility, pregnancy and lactation

Women of childbearing potential

Women of childbearing potential have to use effective contraception during treatment and for 4 weeks following the final dose of upadacitinib. Female paediatric patients and/or their parents/caregivers should be informed about the need to contact the treating physician once the patient experiences menarche while taking upadacitinib.

Pregnancy

There are no or limited data on the use of upadacitinib in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). Upadacitinib was teratogenic in rats and rabbits with effects in bones in rat foetuses and in the heart in rabbit foetuses when exposed *in utero*.

Upadacitinib is contraindicated during pregnancy (see section 4.3).

If a patient becomes pregnant while taking upadacitinib the parents should be informed of the potential risk to the foetus.

Breast-feeding

It is unknown whether upadacitinib/metabolites are excreted in human milk. Available pharmacodynamic/toxicological data in animals have shown excretion of upadacitinib in milk (see section 5.3).

A risk to newborns/infants cannot be excluded.

Upadacitinib should not be used during breast-feeding. A decision must be made whether to discontinue breast-feeding or to discontinue upadacitinib therapy taking into account the benefit of breast-feeding for the child and the benefit of therapy for the woman.

Fertility

The effect of upadacitinib on human fertility has not been evaluated. Animal studies do not indicate effects with respect to fertility (see section 5.3).

4.7 Effects on ability to drive and use machines

Upadacitinib may have a minor influence on the ability to drive and use machines because dizziness and vertigo may occur during treatment with RINVOQ (see section 4.8).

4.8 Undesirable effects

Summary of the safety profile

In the placebo-controlled clinical trials for rheumatoid arthritis, psoriatic arthritis, and axial spondyloarthritis, the most commonly reported adverse reactions ($\geq 2\%$ of patients in at least one of the indications with the highest rate among indications presented) with upadacitinib 15 mg were upper respiratory tract infections (19.5%), blood creatine phosphokinase (CPK) increased (8.6%), alanine transaminase increased (4.3%), bronchitis (3.9%), nausea (3.5%), neutropenia (2.8%), cough (2.2%), aspartate transaminase increased (2.2%), and hypercholesterolaemia (2.2%).

In the placebo-controlled atopic dermatitis clinical trials, the most commonly reported adverse reactions ($\geq 2\%$ of patients) with upadacitinib 15 mg or 30 mg were upper respiratory tract infection (25.4%), acne (15.1%), herpes simplex (8.4%), headache (6.3%), blood CPK increased (5.5%), cough (3.2%), folliculitis (3.2%), abdominal pain (2.9%), nausea (2.7%), neutropenia (2.3%), pyrexia (2.1%), and influenza (2.1%).

In the placebo-controlled ulcerative colitis and Crohn's disease induction and maintenance clinical trials, the most commonly reported adverse reactions ($\geq 3\%$ of patients) with upadacitinib 45 mg, 30 mg or 15 mg were upper respiratory tract infection (19.9%), pyrexia (8.7%), blood CPK increased (7.6%), anaemia (7.4%), headache (6.6%), acne (6.3%), herpes zoster (6.1%), neutropenia (6.0%), rash (5.2%), pneumonia (4.1%), hypercholesterolemia (4.0%), bronchitis (3.9%), aspartate transaminase increased (3.9%), fatigue (3.9%), folliculitis (3.6%), alanine transaminase increased (3.5%), herpes simplex (3.2%), and influenza (3.2%).

The most common serious adverse reactions were serious infections (see section 4.4).

The safety profile of upadacitinib with long-term treatment was generally similar to the safety profile during the placebo-controlled period across indications.

Tabulated list of adverse reactions

The following list of adverse reactions is based on experience from clinical studies and post-marketing experience. The frequency of adverse reactions listed below is defined using the following convention: very common ($\geq 1/10$); common ($\geq 1/100$ to $< 1/10$); uncommon ($\geq 1/1\ 000$ to $< 1/100$); rare ($\geq 1/10\ 000$ to $< 1/1\ 000$). The frequencies in Table 3 are based on the higher of the rates for adverse reactions reported with RINVOQ in clinical trials of rheumatologic disease (15 mg), atopic dermatitis (15 mg and 30 mg), alopecia areata (15 mg and 30 mg), vitiligo (15 mg), ulcerative colitis (15 mg, 30 mg and 45 mg), or Crohn's disease (15 mg, 30 mg, and 45 mg). When notable differences in frequency were observed between indications, these are presented in the footnotes below the table.

Table 3 Adverse reactions

System Organ Class	Very common	Common	Uncommon	Rare
Infections and infestations	Upper respiratory tract infections (URTI) ^a	Bronchitis ^{a,b} Herpes zoster ^a Herpes simplex ^a Folliculitis Influenza Urinary tract infection Pneumonia ^{a,h}	Oral candidiasis Diverticulitis Sepsis	
Neoplasms benign, malignant and unspecified (including cysts and polyps)		Non-melanoma skin cancer ^f		
Blood and lymphatic system disorders		Anaemia ^a Neutropenia ^a Lymphopenia		
Immune system disorders		Urticaria ^{c,g}	Serious hypersensitivity reactions ^{a,e}	
Metabolism and nutrition disorders		Hypercholesterolaemia ^{a,b} Hyperlipidaemia ^{a,b}	Hypertriglyceridaemia	
Nervous system disorders		Headache ^{a,j} Dizziness		
Ear and labyrinth disorders		Vertigo ^a		
Respiratory, thoracic and mediastinal disorders		Cough		
Gastrointestinal disorders		Abdominal pain ^a Nausea	Gastrointestinal perforation ⁱ	
Skin and subcutaneous tissue disorders	Acne ^{a,c,d,g}	Rash ^a		
Reproductive system and breast disorders				Semen discolouration ^l
General disorders and administration site conditions		Fatigue Pyrexia Peripheral oedema ^{a,k}		
Investigations		Blood CPK increased ALT increased ^b AST increased ^b Weight increased ^g		

^a Presented as grouped term

^b In atopic dermatitis trials, the frequency of bronchitis, hypercholesterolaemia, hyperlipidaemia, ALT increased, and AST increased was uncommon.

^c In rheumatologic disease trials, the frequency was common for acne and uncommon for urticaria.

^d In ulcerative colitis trials, the frequency was common for acne.

^e Serious hypersensitivity reactions including anaphylactic reaction and angioedema

^f Most events reported as basal cell carcinoma and squamous cell carcinoma of skin

^g In Crohn's disease, the frequency was common for acne, and uncommon for urticaria and weight increased.

^h Pneumonia was common in Crohn's disease and uncommon across other indications.

ⁱ Frequency is based on Crohn's disease clinical trials.

^j Headache was very common in the giant cell arteritis trial.

^k Frequency is based on the giant cell arteritis trial.

^l Reports of semen discolouration, mostly blue and less frequently green, have occurred predominantly in patients taking upadacitinib for ulcerative colitis or Crohn's disease. The clinical significance of semen discolouration is unknown.

Description of selected adverse reactions

Rheumatoid arthritis

Infections

In placebo-controlled clinical studies with background DMARDs, the frequency of infection over 12/14 weeks in the upadacitinib 15 mg group was 27.4% compared to 20.9% in the placebo group. In methotrexate (MTX)-controlled studies, the frequency of infection over 12/14 weeks in the upadacitinib 15 mg monotherapy group was 19.5% compared to 24.0% in the MTX group. The overall long-term rate of infections for the upadacitinib 15 mg group across all five Phase 3 clinical studies (2 630 patients) was 93.7 events per 100 patient-years.

In placebo-controlled clinical studies with background DMARDs, the frequency of serious infection over 12/14 weeks in the upadacitinib 15 mg group was 1.2% compared to 0.6% in the placebo group. In MTX-controlled studies, the frequency of serious infection over 12/14 weeks in the upadacitinib 15 mg monotherapy group was 0.6% compared to 0.4% in the MTX group. The overall long-term rate of serious infections for the upadacitinib 15 mg group across all five Phase 3 clinical studies was 3.8 events per 100 patient-years. The most common serious infection was pneumonia. The rate of serious infections remained stable with long-term exposure.

Opportunistic infections (excluding tuberculosis)

In placebo-controlled clinical studies with background DMARDs, the frequency of opportunistic infections over 12/14 weeks in the upadacitinib 15 mg group was 0.5% compared to 0.3% in the placebo group. In MTX-controlled studies, there were no cases of opportunistic infection over 12/14 weeks in the upadacitinib 15 mg monotherapy group and 0.2% in the MTX group. The overall long-term rate of opportunistic infections for the upadacitinib 15 mg group across all five Phase 3 clinical studies was 0.6 events per 100 patient-years.

The long-term rate of herpes zoster for the upadacitinib 15 mg group across all five Phase 3 clinical studies was 3.7 events per 100 patient-years. Most of the herpes zoster events involved a single dermatome and were non-serious.

Hepatic transaminase elevations

In placebo-controlled studies with background DMARDs, for up to 12/14 weeks, alanine transaminase (ALT) and aspartate transaminase (AST) elevations $\geq 3 \times$ upper limit of normal (ULN) in at least one measurement were observed in 2.1% and 1.5% of patients treated with upadacitinib 15 mg, compared to 1.5% and 0.7%, respectively, of patients treated with placebo. Of the 22 cases of hepatic transaminase elevations, most were asymptomatic and transient.

In MTX-controlled studies, for up to 12/14 weeks, ALT and AST elevations $\geq 3 \times$ ULN in at least one measurement were observed in 0.8% and 0.4% of patients treated with upadacitinib 15 mg, compared to 1.9% and 0.9%, respectively, of patients treated with MTX.

The pattern and incidence of elevation in ALT/AST remained stable over time including in long-term extension studies.

Lipid elevations

Upadacitinib 15 mg treatment was associated with increases in lipid parameters including total cholesterol, triglycerides, LDL cholesterol and HDL cholesterol. There was no change in the LDL/HDL ratio. Elevations were observed at 2 to 4 weeks of treatment and remained stable with longer-term treatment. Among patients in the controlled studies with baseline values below the specified limits, the following frequencies of patients were observed to shift to above the specified limits on at least one occasion during 12/14 weeks (including patients who had an isolated elevated value):

- Total cholesterol ≥ 5.17 mmol/L (200 mg/dL): 62% vs. 31%, in the upadacitinib 15 mg and placebo groups, respectively
- LDL cholesterol ≥ 3.36 mmol/L (130 mg/dL): 42% vs. 19%, in the upadacitinib 15 mg and placebo groups, respectively
- HDL cholesterol ≥ 1.03 mmol/L (40 mg/dL): 89% vs. 61%, in the upadacitinib 15 mg and placebo groups, respectively
- Triglycerides ≥ 2.26 mmol/L (200 mg/dL): 25% vs. 15%, in the upadacitinib 15 mg and placebo groups, respectively

Creatine phosphokinase

In placebo-controlled studies with background DMARDs, for up to 12/14 weeks, increases in CPK values were observed. CPK elevations > 5 x upper limit of normal (ULN) were reported in 1.0% and 0.3% of patients over 12/14 weeks in the upadacitinib 15 mg and placebo groups, respectively. Most elevations > 5 x ULN were transient and did not require treatment discontinuation. Mean CPK values increased by 4 weeks with a mean increase of 60 U/L at 12 weeks and then remained stable at an increased value thereafter including with extended therapy.

Neutropenia

In placebo-controlled studies with background DMARDs, for up to 12/14 weeks, decreases in neutrophil counts below 1×10^9 cells/L in at least one measurement occurred in 1.1% and $<0.1\%$ of patients in the upadacitinib 15 mg and placebo groups, respectively. In clinical studies, treatment was interrupted in response to ANC $< 1 \times 10^9$ cells/L (see section 4.2). Mean neutrophil counts decreased over 4 to 8 weeks. The decreases in neutrophil counts remained stable at a lower value than baseline over time including with extended therapy.

Psoriatic arthritis

Overall, the safety profile observed in patients with active psoriatic arthritis treated with upadacitinib 15 mg was consistent with the safety profile observed in patients with rheumatoid arthritis. A higher rate of serious infections (2.6 events per 100 patient-years and 1.3 events per 100 patient-years, respectively) and hepatic transaminase elevations (ALT elevations Grade 3 and higher rates 1.4% and 0.4%, respectively) was observed in patients treated with upadacitinib in combination with MTX therapy compared to patients treated with monotherapy.

Axial spondyloarthritis

Overall, the safety profile observed in patients with active axial spondyloarthritis treated with upadacitinib 15 mg was consistent with the safety profile observed in patients with rheumatoid arthritis. No new safety findings were identified.

Giant cell arteritis

Overall, the safety profile observed in patients with giant cell arteritis treated with upadacitinib 15 mg was generally consistent with the known safety profile for upadacitinib.

Serious Infections

In the placebo-controlled clinical study, the frequency of serious infections over 52 weeks was 5.7% in the upadacitinib 15 mg group and 10.7% in the placebo group. The long-term rate of serious infections was 5.9 events per 100 patient-years for the upadacitinib 15 mg group and 10.5 events per 100 patient-years for the placebo group.

Opportunistic infections (excluding tuberculosis)

In the placebo-controlled clinical study, the frequency of opportunistic infection (excluding tuberculosis and herpes zoster) over 52 weeks was 1.9% in the upadacitinib 15 mg group and 0.9% in the placebo group. The long-term rate of opportunistic infections (excluding tuberculosis and herpes zoster) was 1.8 events per 100 patient-years for the upadacitinib 15 mg group and 1.5 events per 100 patient-years for the placebo group.

In the placebo-controlled clinical study, the frequency of herpes zoster over 52 weeks was 5.3% in the upadacitinib 15 mg group and 2.7% in the placebo group. The long-term rate of herpes zoster was 5.9 events per 100 patient-years for the upadacitinib 15 mg group and 3.0 events per 100 patient-years for the placebo group.

Atopic dermatitis

Infections

In the placebo-controlled period of the clinical studies, the frequency of infection over 16 weeks in the upadacitinib 15 mg and 30 mg groups was 39% and 43% compared to 30% in the placebo group, respectively. The long-term rate of infections through week 260 for the upadacitinib 15 mg and 30 mg groups was 82.6 and 92.7 events per 100 patient-years, respectively.

In placebo-controlled clinical studies, the frequency of serious infection over 16 weeks in the upadacitinib 15 mg and 30 mg groups was 0.8% and 0.4% compared to 0.6% in the placebo group, respectively. The long-term rate of serious infections through week 260 for the upadacitinib 15 mg and 30 mg groups was 2.2 and 2.6 events per 100 patient-years, respectively.

Opportunistic infections (excluding tuberculosis)

In the placebo-controlled period of the clinical studies, the most frequently reported opportunistic infection (excluding tuberculosis and herpes zoster) was eczema *herpeticum*. The frequency of eczema *herpeticum* over 16 weeks in the upadacitinib 15 mg and 30 mg groups was 0.7% and 0.8% compared to 0.4% in the placebo group, respectively. The long-term rate of opportunistic infections (excluding tuberculosis and herpes zoster) through week 260 for the upadacitinib 15 mg and 30 mg groups was 1.7 and 2.0 events per 100 patient-years, respectively. The long-term rate of eczema *herpeticum* through week 260 for the upadacitinib 15 mg and 30 mg groups was 1.5 and 1.9 events per 100 patient-years, respectively.

The long-term rate of herpes zoster through week 260 for the upadacitinib 15 mg and 30 mg groups was 3.2 and 5.3 events per 100 patient-years, respectively. Most of the herpes zoster events involved a single dermatome and were non-serious.

Laboratory abnormalities

Dose-dependent changes in ALT increased and/or AST increased ($\geq 3 \times \text{ULN}$), lipid parameters, CPK values ($> 5 \times \text{ULN}$), and neutropenia ($\text{ANC} < 1 \times 10^9 \text{ cells/L}$) associated with upadacitinib treatment were similar to what was observed in the rheumatologic disease clinical studies.

Small increases in LDL cholesterol were observed after week 16 in atopic dermatitis studies. At week 52, the mean increase in LDL cholesterol from baseline was 0.41 mmol/L for upadacitinib 15 mg and 0.56 mmol/L for upadacitinib 30 mg.

Alopecia areata

The safety profile of upadacitinib 15 mg and 30 mg observed in patients with alopecia areata was generally consistent with the known safety profile in patients with atopic dermatitis. No new safety findings were identified.

Vitiligo

The safety profile of upadacitinib 15 mg observed in patients with vitiligo was generally consistent with the known safety profile in patients with atopic dermatitis. No new safety findings were identified. A higher incidence of hypercholesterolaemia was observed in patients with vitiligo treated with upadacitinib 15 mg (3.4%) compared to placebo (2.0%).

Ulcerative colitis

The overall safety profile observed in patients with ulcerative colitis was generally consistent with that observed in patients with rheumatoid arthritis.

A higher rate of herpes zoster was observed with an induction treatment period of 16 weeks vs 8 weeks.

Infections

In the placebo-controlled induction studies, the frequency of infection over 8 weeks in the upadacitinib 45 mg group compared to the placebo group was 20.7% and 17.5%, respectively. In the placebo-controlled maintenance study, the frequency of infection over 52 weeks in the upadacitinib 15 mg and 30 mg groups was 40.4% and 44.2%, respectively, compared to 38.8% in the placebo group. The long-term rate of infections for upadacitinib 15 mg and 30 mg was 64.5 and 77.8 events per 100 patient-years, respectively.

In the placebo-controlled induction studies, the frequency of serious infection over 8 weeks in both the upadacitinib 45 mg group and the placebo group was 1.3%. No additional serious infections were observed over 8-week extended treatment with upadacitinib 45 mg. In the placebo-controlled maintenance study, the frequency of serious infection over 52 weeks in the upadacitinib 15 mg and 30 mg groups was 3.6% and 3.2%, respectively, compared to 3.3% in the placebo group. The long-term rate of serious infections for the upadacitinib 15 mg and 30 mg groups was 3.0 and 4.6 events per 100 patient-years, respectively. The most frequently reported serious infection in the induction and maintenance phases was COVID-19 pneumonia.

Opportunistic infections (excluding tuberculosis)

In the placebo-controlled induction studies over 8 weeks, the frequency of opportunistic infection (excluding tuberculosis and herpes zoster) in the upadacitinib 45 mg group was 0.4% and 0.3% in the placebo group. No additional opportunistic infections (excluding tuberculosis and herpes zoster) were observed over 8-week extended treatment with upadacitinib 45 mg. In the placebo-controlled maintenance study over 52 weeks, the frequency of opportunistic infection (excluding tuberculosis and herpes zoster) in the upadacitinib 15 mg and 30 mg groups was 0.8% and 0.8%, respectively, compared to 0.8% in the placebo group. The long-term rate of opportunistic infections (excluding tuberculosis and herpes zoster) for the upadacitinib 15 mg and 30 mg groups was 0.3 and 0.6 events per 100 patient-years, respectively.

In the placebo-controlled induction studies over 8 weeks, the frequency of herpes zoster in the upadacitinib 45 mg group was 0.6% and 0% in the placebo group. The frequency of herpes zoster was 3.9% over 16-week treatment with upadacitinib 45 mg. In the placebo-controlled maintenance study

over 52 weeks, the frequency of herpes zoster in the upadacitinib 15 mg and 30 mg groups was 4.8% and 5.6%, respectively, compared to 0% in the placebo group. The long-term rate of herpes zoster for the upadacitinib 15 mg and 30 mg groups was 4.5 and 7.2 events per 100 patient-years, respectively.

Gastrointestinal perforations

In the placebo-controlled maintenance period, gastrointestinal perforation was reported in 1 patient treated with placebo (1.5 per 100 patient-years) and no patients treated with upadacitinib 15 mg or 30 mg. In the long-term extension study, 1 patient treated with upadacitinib 15 mg (0.1 per 100 patient-years) and 1 patient treated with upadacitinib 30 mg (<0.1 per 100 patient-years) reported events.

Laboratory abnormalities

In the induction and maintenance clinical studies, the laboratory changes in ALT increased and/or AST increased ($\geq 3 \times \text{ULN}$), CPK values ($> 5 \times \text{ULN}$), and neutropenia ($\text{ANC} < 1 \times 10^9 \text{ cells/L}$) associated with upadacitinib treatment were generally similar to what was observed in the rheumatologic disease and atopic dermatitis clinical studies. Dose-dependent changes for these laboratory parameters associated with 15 mg and 30 mg upadacitinib treatment were observed.

In the placebo-controlled induction studies for up to 8 weeks, decreases in lymphocyte counts below $0.5 \times 10^9 \text{ cells/L}$ in at least one measurement occurred in 2.0% and 0.8% of patients in the upadacitinib 45 mg and placebo groups, respectively. In the placebo-controlled maintenance study, for up to 52 weeks, decreases in lymphocyte counts below $0.5 \times 10^9 \text{ cells/L}$ in at least one measurement occurred in 1.6%, 1.2% and 0.8% of patients in the upadacitinib 15 mg, 30 mg and placebo groups, respectively. In clinical studies, treatment was interrupted in response to $\text{ALC} < 0.5 \times 10^9 \text{ cells/L}$ (see section 4.2). No notable mean changes of lymphocyte counts were observed during upadacitinib treatment over time.

Elevations in lipid parameters were observed at 8 weeks of treatment with upadacitinib 45 mg and remained generally stable with longer-term treatment with upadacitinib 15 mg and 30 mg. Among patients in the placebo-controlled induction studies with baseline values below the specified limits, the following frequencies of patients were observed to shift to above the specified limits on at least one occasion during 8 weeks (including patients who had an isolated elevated value):

- Total cholesterol $\geq 5.17 \text{ mmol/L}$ (200 mg/dL): 49% vs. 11%, in the upadacitinib 45 mg and placebo groups, respectively
- LDL cholesterol $\geq 3.36 \text{ mmol/L}$ (130 mg/dL): 27% vs. 9%, in the upadacitinib 45 mg and placebo groups, respectively
- HDL cholesterol $\geq 1.03 \text{ mmol/L}$ (40 mg/dL): 79% vs. 36%, in the upadacitinib 45 mg and placebo groups, respectively
- Triglycerides $\geq 2.26 \text{ mmol/L}$ (200 mg/dL): 6% vs 4% in the upadacitinib 45 mg and placebo groups, respectively

Crohn's disease

Overall, the safety profile observed in patients with Crohn's disease treated with upadacitinib was consistent with the known safety profile for upadacitinib.

Serious infections

In the placebo-controlled induction studies, the frequency of serious infection over 12 weeks in the upadacitinib 45 mg group and the placebo group was 1.9% and 1.7%, respectively. In the placebo-controlled maintenance study, the frequency of serious infection over 52 weeks in the upadacitinib 15 mg and 30 mg groups was 3.2% and 5.7%, respectively, compared to 4.5% in the placebo group. The long-term rate of serious infections for the upadacitinib 15 mg and 30 mg groups in patients who responded to upadacitinib 45 mg as induction treatment was 5.1 and 7.3 events per 100 patient-years, respectively. The most frequently reported serious infection in the induction and maintenance studies was gastrointestinal infections.

Gastrointestinal perforations

During the placebo-controlled period in the Phase 3 induction clinical studies, gastrointestinal perforation was reported in 1 patient (0.1%) treated with upadacitinib 45 mg and no patients on placebo through 12 weeks. In all patients treated with upadacitinib 45 mg (n=938) during the induction studies, gastrointestinal perforation was reported in 4 patients (0.4%).

In the long-term placebo-controlled period, gastrointestinal perforation was reported in 1 patient each treated with placebo (0.7 per 100 patient-years), upadacitinib 15 mg (0.4 per 100 patient-years), and upadacitinib 30 mg (0.4 per 100 patient-years). In all patients treated with rescue upadacitinib 30 mg (n=336), gastrointestinal perforation was reported in 3 patients (0.8 per 100 patient-years) through long-term treatment.

Laboratory abnormalities

In the induction and maintenance clinical studies, the laboratory changes in ALT increased and/or AST increased ($\geq 3 \times \text{ULN}$), CPK values ($> 5 \times \text{ULN}$), neutropenia ($\text{ANC} < 1 \times 10^9 \text{ cells/L}$), and lipid parameters associated with upadacitinib treatment were generally similar to what was observed in the rheumatologic disease, atopic dermatitis and ulcerative colitis clinical studies. Dose-dependent changes for these laboratory parameters associated with 15 mg and 30 mg upadacitinib treatment were observed.

In the placebo-controlled induction studies for up to 12 weeks, decreases in lymphocyte counts below $0.5 \times 10^9 \text{ cells/L}$ in at least one measurement occurred in 2.2% and 2.0% of patients in the upadacitinib 45 mg and placebo groups, respectively. In the placebo-controlled maintenance study, for up to 52 weeks, decreases in lymphocyte counts below $0.5 \times 10^9 \text{ cells/L}$ in at least one measurement occurred in 4.6%, 5.2% and 1.8% of patients in the upadacitinib 15 mg, 30 mg and placebo groups, respectively. In clinical studies, treatment was interrupted in response to $\text{ALC} < 0.5 \times 10^9 \text{ cells/L}$ (see section 4.2). No notable mean changes of lymphocyte counts were observed during upadacitinib treatment over time.

In the placebo-controlled induction studies for up to 12 weeks, decreases in haemoglobin concentration to below 8 g/dL in at least one measurement occurred in 2.7% and 1.4% of patients in the upadacitinib 45 mg and placebo groups, respectively. In the placebo-controlled maintenance study, for up to 52 weeks, decreases in haemoglobin concentration below 8 g/dL in at least one measurement occurred in 1.4%, 4.4% and 2.8% of patients in the upadacitinib 15 mg, 30 mg and placebo groups, respectively. In clinical studies, treatment was interrupted in response to $\text{Hb} < 8 \text{ g/dL}$ (see section 4.2). No notable mean changes of haemoglobin concentration were observed during upadacitinib treatment over time.

Elderly

Based on the limited data from patients 65 years and older with atopic dermatitis, ulcerative colitis and Crohn's disease, there was a higher rate of overall adverse reactions with the upadacitinib 30 mg dose compared to the 15 mg dose (see section 4.4).

No data was available in patients 65 years of age and older with severe alopecia areata.

Of the 612 patients treated in the vitiligo Phase 3 clinical studies, 55 were 65 years of age or older, of whom 36 were treated with upadacitinib 15 mg during the placebo-controlled period. Overall, the rates of serious and severe adverse reactions in patients 65 years of age or older were comparable between the upadacitinib 15 mg and placebo groups.

Paediatric population

Atopic dermatitis

A total of 541 adolescents aged 12 to 17 years with atopic dermatitis were treated in the global Phase 3 studies (n=343) and the supplemental adolescent substudies (n=198), of whom 264 were exposed to 15 mg and 265 were exposed to 30 mg. The safety profile for upadacitinib 15 mg and 30 mg in adolescents was similar to that in adults through week 260. The long-term rate of the adverse drug reaction of skin papilloma through week 260 for the upadacitinib 15 mg and 30 mg groups was 2.2 and 3.9 events per 100 patient-years, respectively.

Alopecia areata

A total of 117 adolescents aged 12 to 17 years weighing at least 30 kg with alopecia areata were treated with upadacitinib in the placebo-controlled Phase 3 studies, of whom 62 were exposed to 15 mg and 57 were exposed to 30 mg. The safety profile for upadacitinib 15 mg and 30 mg in adolescents was similar to that in adults.

Vitiligo

A total of 52 adolescents with vitiligo aged 12 to 17 years weighing at least 30 kg were treated with upadacitinib 15 mg in the Phase 3 studies, of whom 37 received upadacitinib 15 mg during the placebo-controlled period. The safety profile of upadacitinib 15 mg observed in adolescent patients with vitiligo was generally consistent with the known safety profile in adolescent patients with atopic dermatitis. No new safety findings were identified. There were no serious adverse events reported in the adolescent population treated with upadacitinib in the placebo-controlled period.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via HPRA Pharmacovigilance Website: www.hpra.ie.

4.9 Overdose

Upadacitinib was administered in clinical studies up to doses equivalent in daily AUC to 60 mg prolonged-release once daily. Adverse reactions were comparable to those seen at lower doses and no specific toxicities were identified. Approximately 90% of upadacitinib in the systemic circulation is eliminated within 24 hours of dosing (within the range of doses evaluated in clinical studies). In case of an overdose, it is recommended that the patient be monitored for signs and symptoms of adverse reactions. Patients who develop adverse reactions should receive appropriate treatment.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Immunosuppressants, Janus-associated kinase (JAK) inhibitors ATC code: L04AF03

Mechanism of action

Upadacitinib is a selective and reversible Janus kinase (JAK) inhibitor. JAKs are intracellular enzymes that transmit cytokine or growth factor signals involved in a broad range of cellular processes including inflammatory responses, hematopoiesis, and immune surveillance. The JAK family of enzymes contains four members, JAK1, JAK2, JAK3 and TYK2 which work in pairs to phosphorylate and activate signal transducers and activators of transcription (STATs). This phosphorylation, in turn, modulates gene expression and cellular function. JAK1 is important in inflammatory cytokine signals while JAK2 is important for red blood cell maturation and JAK3 signals play a role in immune surveillance and lymphocyte function.

In human cellular assays, upadacitinib preferentially inhibits signalling by JAK1 or JAK1/3 with functional selectivity over cytokine receptors that signal via pairs of JAK2. Atopic dermatitis is driven by pro-inflammatory cytokines (including IL-4, IL-13, IL-22, TSLP, IL-31 and IFN- γ) that transduce signals via the JAK1 pathway. Inhibiting JAK1 with upadacitinib reduces the signalling of many mediators which drive the signs and symptoms of atopic dermatitis such as eczematous skin lesions and pruritus. Pro-inflammatory cytokines that transduce signals via the JAK1 pathway are involved in the pathology of alopecia areata, although the complete pathophysiology is still not understood. Inhibition of JAK1 by upadacitinib modulates JAK-mediated inflammation, which allows hair regrowth in patients with alopecia areata. Proinflammatory cytokines that transduce signals via the JAK1 pathway are involved in the pathogenesis of vitiligo, although the complete pathophysiology is still not fully understood. Inhibition of JAK1 by upadacitinib blocks the signalling of the JAK-dependent cytokines and chemokines (e.g., IFN γ , IL-15, IL-7, CXCL9, CXCL10) to restore normal melanocyte function, and thereby allows stabilisation of disease and enables repigmentation. Pro-inflammatory cytokines (primarily IL-6, IL-7, IL-15 and IFN γ) transduce signals via the JAK1 pathway and are involved in the pathology of inflammatory bowel diseases. JAK1 inhibition with upadacitinib modulates the signalling of the JAK-dependent cytokines underlying the inflammatory burden and signs and symptoms of inflammatory bowel diseases.

Pharmacodynamic effects

Inhibition of IL-6 induced STAT3 and IL-7 induced STAT5 phosphorylation

In healthy volunteers, the administration of upadacitinib (immediate-release formulation) resulted in a dose- and concentration-dependent inhibition of IL-6 (JAK1/JAK2) - induced STAT3 and IL-7 (JAK1/JAK3)-induced STAT5 phosphorylation in whole blood. The maximal inhibition was observed 1 hour after dosing which returned to near baseline by the end of dosing interval.

Lymphocytes

In patients with rheumatoid arthritis, treatment with upadacitinib was associated with a small, transient increase in mean ALC from baseline up to week 36 which gradually returned to at or near baseline levels with continued treatment.

hsCRP

In patients with rheumatoid arthritis, treatment with upadacitinib was associated with decreases from baseline in mean hsCRP levels as early as week 1 which were maintained with continued treatment.

Vaccine studies

The influence of upadacitinib on the humoral response following administration of adjuvanted recombinant glycoprotein E herpes zoster vaccine was evaluated in 93 patients with rheumatoid arthritis under stable treatment with upadacitinib 15 mg. 98% of patients were on concomitant methotrexate. 49% of patients were on oral corticosteroids at baseline. The primary endpoint was the proportion of patients with a satisfactory humoral response defined as ≥ 4 -fold increase in pre-vaccination concentration of anti-glycoprotein E titer levels at week 16 (4 weeks post-dose 2 vaccination). Vaccination of patients treated with upadacitinib 15 mg resulted in a satisfactory humoral response in 79/90 (88% [95% CI: 81.0, 94.5]) of patients at week 16.

The influence of upadacitinib on the humoral response following the administration of inactivated pneumococcal polysaccharide conjugate vaccine (13-valent, adsorbed) was evaluated in 111 patients with rheumatoid arthritis under stable treatment with upadacitinib 15 mg (n=87) or 30 mg (n=24). 97% of patients (n=108) were on concomitant methotrexate. The primary endpoint was the proportion of patients with satisfactory humoral response defined as ≥ 2 -fold increase in antibody concentration from baseline to week 4 in at least 6 out of the 12 pneumococcal antigens (1, 3, 4, 5, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F). Results at week 4 demonstrated a satisfactory humoral response in 67.5% (95% CI: 57.4, 77.5) and 56.5% (95% CI: 36.3, 76.8) of patients treated with upadacitinib 15 mg and 30 mg, respectively.

Clinical efficacy and safety

Rheumatoid arthritis

The efficacy and safety of upadacitinib 15 mg once daily was assessed in five Phase 3 randomised, double-blind, multicentre studies in patients with moderately to severely active rheumatoid arthritis and fulfilling the ACR/EULAR 2010 classification criteria (see Table 4). Patients 18 years of age and older were eligible to participate. The presence of at least 6 tender and 6 swollen joints and evidence of systemic inflammation based on elevation of hsCRP was required at baseline. Four studies included long-term extensions for up to 5 years, and one study (SELECT-COMPARE) included a long-term extension for up to 10 years.

The primary analysis for each of these studies included all randomised subjects who received at least 1 dose of upadacitinib or placebo, and non-responder imputation was used for categorical endpoints.

Across the Phase 3 studies, the efficacy seen with upadacitinib 15 mg QD was generally similar to that observed with upadacitinib 30 mg QD.

Table 4 Clinical trials summary

Study name	Population (n)	Treatment arms	Key outcome measures
SELECT-EARLY	MTX-naïve ^a (947)	• Upadacitinib 15 mg • Upadacitinib 30 mg • MTX Monotherapy	• Primary endpoint: clinical remission (DAS28-CRP) at week 24 • Low disease activity (DAS28-CRP) • ACR50 • Radiographic progression (mTSS) • Physical function (HAQ-DI) • SF-36 PCS
SELECT-MONOTHERAPY	MTX-IR ^b (648)	• Upadacitinib 15 mg • Upadacitinib 30 mg • MTX Monotherapy	• Primary endpoint: low disease activity (DAS28-CRP) at week 14 • Clinical remission (DAS28-CRP) • ACR20 • Physical function (HAQ-DI) • SF-36 PCS

			• Morning stiffness
SELECT-NEXT	csDMARD-IR ^c (661)	• Upadacitinib 15 mg • Upadacitinib 30 mg • Placebo On background csDMARDs	• Primary endpoint: low disease activity (DAS28-CRP) at week 12 • Clinical remission (DAS28-CRP) • ACR20 • Physical function (HAQ-DI) • SF-36 PCS • Low disease activity (CDAI) • Morning stiffness • FACIT-F
SELECT-COMPARE	MTX-IR ^d (1,629)	• Upadacitinib 15 mg • Placebo • Adalimumab 40 mg On background MTX	• Primary endpoint: clinical remission (DAS28-CRP) at week 12 • Low disease activity (DAS28-CRP) • ACR20 • Low disease activity (DAS28-CRP) vs adalimumab • Radiographic progression (mTSS) • Physical function (HAQ-DI) • SF-36 PCS • Low disease activity (CDAI) • Morning stiffness • FACIT-F
SELECT-BEYOND	bDMARD-IR ^e (499)	• Upadacitinib 15 mg • Upadacitinib 30 mg • Placebo On background csDMARDs	• Primary endpoint: low disease activity (DAS28-CRP) at week 12 • ACR20 • Physical function (HAQ-DI) • SF-36 PCS
Abbreviations: ACR20 (or 50) = American College of Rheumatology $\geq 20\%$ (or $\geq 50\%$) improvement; bDMARD = biologic disease-modifying anti-rheumatic drug, CRP = C-Reactive Protein, DAS28 = Disease Activity Score 28 joints, mTSS = modified Total Sharp Score, csDMARD = conventional synthetic disease-modifying anti-rheumatic drug, HAQ-DI = Health Assessment Questionnaire-Disability Index, SF-36 PCS = Short Form (36) Health Survey (SF-36) Physical Component Summary, CDAI = Clinical Disease Activity Index, FACIT-F = Functional Assessment of Chronic Illness Therapy-Fatigue score, IR = inadequate responder, MTX = methotrexate, n = number randomised ^a Patients were naïve to MTX or received no more than 3 weekly MTX doses ^b Patients had inadequate response to MTX ^c Patients who had an inadequate response to csDMARDs; patients with prior exposure to at most one bDMARD were eligible (up to 20% of total number of patients) if they had either limited exposure (<3 months) or had to discontinue the bDMARD due to intolerability ^d Patients who had an inadequate response to MTX; patients with prior exposure to at most one bDMARD (except adalimumab) were eligible (up to 20% of total study number of patients) if they had either limited exposure (<3 months) or had to discontinue the bDMARD due to intolerability ^e Patients who had an inadequate response or intolerance to at least one bDMARD			

Clinical response

Remission and low disease activity

In the studies, a significantly higher proportion of patients treated with upadacitinib 15 mg achieved low disease activity (DAS28-CRP ≤ 3.2) and clinical remission (DAS28-CRP < 2.6) compared to placebo, MTX, or adalimumab (Table 5). Compared to adalimumab, significantly higher rates of low

disease activity were achieved at week 12 in SELECT-COMPARE. Overall, both low disease activity and clinical remission rates were consistent across patient populations, with or without MTX. At 3 years, 297/651 (45.6%) and 111/327 (33.9%) patients remained on originally randomised treatment of upadacitinib 15 mg or adalimumab, respectively, in SELECT-COMPARE, and 216/317 (68.1%) and 149/315 (47.3%) patients remained on originally randomised treatment of upadacitinib 15 mg or MTX monotherapy, respectively, in SELECT-EARLY. Among the patients who remained on their originally allocated treatment, low disease activity and clinical remission were maintained through 3 years.

ACR response

In all studies, more patients treated with upadacitinib 15 mg achieved ACR20, ACR50, and ACR70 responses at 12 weeks compared to placebo, MTX, or adalimumab (Table 5). Time to onset of efficacy was rapid across measures with greater responses seen as early as week 1 for ACR20. Durable response rates were observed (with or without MTX), with ACR20/50/70 responses maintained through 3 years among the patients who remained on their originally allocated treatment.

Treatment with upadacitinib 15 mg, alone or in combination with csDMARDs, resulted in improvements in individual ACR components, including tender and swollen joint counts, patient and physician global assessments, HAQ-DI, pain assessment and hsCRP.

Table 5 Response and remission

Study	SELECT EARLY MTX-Naïve		SELECT MONO MTX-IR		SELECT NEXT csDMARD-IR		SELECT COMPARE MTX-IR			SELECT BEYOND bDMARD-IR	
	MTX	UPA 15mg	MTX	UPA 15mg	PBO	UPA 15mg	PBO	UPA 15mg	ADA 40mg	PBO	UPA 15mg
N	314	317	216	217	221	221	651	651	327	169	164
Week											
LDA DAS28-CRP ≤3.2 (% of patients)											
12 ^a /14 ^b	28	53 ^g	19	45 ^e	17	48 ^e	14	45 ^{e,h}	29	14	43 ^e
24 ^c /26 ^d	32	60 ^f					18	55 ^{g,h}	39		
48	39	59 ^g						50 ^h	35		
CR DAS28-CRP <2.6 (% of patients)											
12 ^a /14 ^b	14	36 ^g	8	28 ^e	10	31 ^e	6	29 ^{e,h}	18	9	29 ^g
24 ^c /26 ^d	18	48 ^e					9	41 ^{g,h}	27		
48	29	49 ^g						38 ⁱ	28		
ACR20 (% of patients)											
12 ^a /14 ^b	54	76 ^g	41	68 ^e	36	64 ^e	36	71 ^{e,j}	63	28	65 ^e
24 ^c /26 ^d	59	79 ^g					36	67 ^{g,i}	57		
48	57	74 ^g						65 ⁱ	54		
ACR50 (% of patients)											
12 ^a /14 ^b	28	52 ^g	15	42 ^g	15	38 ^g	15	45 ^{g,h}	29	12	34 ^g
24 ^c /26 ^d	33	60 ^e					21	54 ^{g,h}	42		
48	43	63 ^g						49 ⁱ	40		
ACR70 (% of patients)											
12 ^a /14 ^b	14	32 ^g	3	23 ^g	6	21 ^g	5	25 ^{g,h}	13	7	12
24 ^c /26 ^d	18	44 ^g					10	35 ^{g,h}	23		
48	29	51 ^g						36 ^h	23		
CDAI ≤10 (% of patients)											
12 ^a /14 ^b	30	46 ^g	25	35 ^l	19	40 ^e	16	40 ^{e,h}	30	14	32 ^g
24 ^c /26 ^d	38	56 ^g					22	53 ^{g,h}	38		

48	43	60 ^g						47 ^h	34		
Abbreviations: ACR20 (or 50 or 70) = American College of Rheumatology $\geq 20\%$ (or $\geq 50\%$ or $\geq 70\%$) improvement; ADA = adalimumab; CDAI = Clinical Disease Activity Index; CR = Clinical Remission; CRP = C-Reactive Protein, DAS28 = Disease Activity Score 28 joints; IR = inadequate responder; LDA = Low Disease Activity; MTX = methotrexate; PBO = placebo; UPA= upadacitinib ^a SELECT-NEXT, SELECT-EARLY, SELECT-COMPARE, SELECT-BEYOND ^b SELECT-MONOTHERAPY ^c SELECT-EARLY ^d SELECT-COMPARE ^e multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo or MTX comparison ^f multiplicity-controlled $p \leq 0.01$ upadacitinib vs placebo or MTX comparison ^g nominal $p \leq 0.001$ upadacitinib vs placebo or MTX comparison ^h nominal $p \leq 0.001$ upadacitinib vs adalimumab comparison ⁱ nominal $p \leq 0.01$ upadacitinib vs adalimumab comparison ^j nominal $p < 0.05$ upadacitinib vs adalimumab comparison ^k nominal $p \leq 0.01$ upadacitinib vs placebo or MTX comparison ^l nominal $p < 0.05$ upadacitinib vs MTX comparison Note: Week 48-data derived from analysis on Full Analysis set (FAS) by randomised group using Non-Responder Imputation											

Radiographic response

Inhibition of progression of structural joint damage was assessed using the modified Total Sharp Score (mTSS) and its components, the erosion score and joint space narrowing score, at weeks 24/26 and week 48 in SELECT-EARLY and SELECT-COMPARE.

Treatment with upadacitinib 15 mg resulted in significantly greater inhibition of the progression of structural joint damage compared to placebo in combination with MTX in SELECT-COMPARE and as monotherapy compared to MTX in SELECT-EARLY (Table 6). Analyses of erosion and joint space narrowing scores were consistent with the overall scores. The proportion of patients with no radiographic progression (mTSS change ≤ 0) was significantly higher with upadacitinib 15 mg in both studies. Inhibition of progression of structural joint damage was maintained through week 96 in both studies for patients who remained on their originally allocated treatment with upadacitinib 15 mg (based on available results from 327 patients in SELECT-COMPARE and 238 patients in SELECT-EARLY).

Table 6 Radiographic changes

Study	SELECT EARLY MTX-Naïve		SELECT COMPARE MTX-IR		
	MTX	UPA 15 mg	PBO ^a	UPA 15 mg	ADA 40 mg
Modified Total Sharp Score, mean change from baseline					
Week 24 ^b /26 ^c	0.7	0.1 ^f	0.9	0.2 ^g	0.1
Week 48	1.0	0.03 ^e	1.7	0.3 ^e	0.4
Proportion of patients with no radiographic progression^d					
Week 24 ^b /26 ^c	77.7	87.5 ^f	76.0	83.5 ^f	86.8
Week 48	74.3	89.9 ^e	74.1	86.4 ^e	87.9
Abbreviations: ADA = adalimumab; IR = inadequate responder; MTX = methotrexate; PBO = placebo; UPA= upadacitinib					
^a All placebo data at week 48 derived using linear extrapolation					
^b SELECT-EARLY					
^c SELECT-COMPARE					
^d No progression defined as mTSS change ≤ 0					

^e nominal $p \leq 0.001$ upadacitinib vs placebo or MTX comparison
^f multiplicity-controlled $p \leq 0.01$ upadacitinib vs placebo or MTX comparison
^g multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo or MTX comparison

Physical function response and health-related outcomes

Treatment with upadacitinib 15 mg, alone or in combination with csDMARDs, resulted in a significantly greater improvement in physical function compared to all comparators as measured by HAQ-DI (see Table 7). Improvement in HAQ-DI was maintained through 3 years for patients who remained on their originally allocated treatment with upadacitinib 15 mg based on available results from SELECT-COMPARE and SELECT-EARLY.

Table 7 Mean change from baseline in HAQ-DI^{a,b}

Study	SELECT EARLY MTX-Naïve		SELECT MONO MTX-IR		SELECT NEXT csDMARD-IR		SELECT COMPARE MTX-IR			SELECT BEYOND BIO-IR	
	MTX	UPA 15mg	MTX	UPA 15mg	PBO	UPA 15mg	PBO	UPA 15mg	ADA 40mg	PBO	UPA 15mg
Treatment group											
N	313	317	216	216	220	216	648	644	324	165	163
Baseline score, mean	1.6	1.6	1.5	1.5	1.4	1.5	1.6	1.6	1.6	1.6	1.7
Week 12 ^c /14 ^d	-0.5	-0.8 ^h	-0.3	-0.7 ^g	-0.3	-0.6 ^g	-0.3	-0.6 ^{g,i}	-0.5	-0.2	-0.4 ^g
Week 24 ^e /26 ^f	-0.6	-0.9 ^g					-0.3	-0.7 ^{h,i}	-0.6		

Abbreviations: ADA = adalimumab; HAQ-DI = Health Assessment Questionnaire-Disability Index; IR = inadequate responder; MTX = methotrexate; PBO = placebo; UPA = upadacitinib

^a Data shown are mean

^b Health Assessment Questionnaire-Disability Index: 0=best, 3=worst; 20 questions; 8 categories: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and activities.

^c SELECT-EARLY, SELECT-NEXT, SELECT-COMPARE, SELECT-BEYOND

^d SELECT-MONOTHERAPY

^e SELECT-EARLY

^f SELECT-COMPARE

^g multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo or MTX comparison

^h nominal $p \leq 0.001$ upadacitinib vs placebo or MTX comparison

ⁱ nominal $p \leq 0.01$ upadacitinib vs adalimumab comparison

In the studies SELECT-MONOTHERAPY, SELECT-NEXT, and SELECT-COMPARE, treatment with upadacitinib 15 mg resulted in a significantly greater improvement in the mean duration of morning joint stiffness compared to placebo or MTX.

In the clinical studies, upadacitinib-treated patients reported significant improvements in patient-reported quality of life, as measured by the Short Form (36) Health Survey (SF-36) Physical Component Summary compared to placebo and MTX. Moreover, upadacitinib-treated patients reported significant improvements in fatigue, as measured by the Functional Assessment of Chronic Illness Therapy-Fatigue score (FACIT-F) compared to placebo.

Psoriatic arthritis

The efficacy and safety of upadacitinib 15 mg once daily were assessed in two Phase 3 randomised, double-blind, multicentre, placebo-controlled studies in patients 18 years of age or older with moderately to severely active psoriatic arthritis. All patients had active psoriatic arthritis for at least 6 months based upon the Classification Criteria for Psoriatic Arthritis (CASPAR), at least 3 tender joints

and at least 3 swollen joints, and active plaque psoriasis or history of plaque psoriasis. For both studies, the primary endpoint was the proportion of patients who achieved an ACR20 response at week 12.

SELECT-PsA 1 was a 24-week trial in 1705 patients who had an inadequate response or intolerance to at least one non-biologic DMARD. At baseline, 1393 (82%) of patients were on at least one concomitant non-biologic DMARD; 1084 (64%) of patients received concomitant MTX only; and 311 (18%) of patients were on monotherapy. Patients received upadacitinib 15 mg or 30 mg once daily, adalimumab, or placebo. At week 24, all patients randomised to placebo were switched to upadacitinib 15 mg or 30 mg once daily in a blinded manner. SELECT-PsA 1 included a long-term extension for up to 5 years.

SELECT-PsA 2 was a 24-week trial in 642 patients who had an inadequate response or intolerance to at least one biologic DMARD. At baseline, 296 (46%) of patients were on at least one concomitant non-biologic DMARD; 222 (35%) of patients received concomitant MTX only; and 345 (54%) of patients were on monotherapy. Patients received upadacitinib 15 mg or 30 mg once daily or placebo. At week 24, all patients randomised to placebo were switched to upadacitinib 15 mg or 30 mg once daily in a blinded manner. SELECT-PsA 2 included a long-term extension for up to 3 years.

Clinical response

In both studies, a statistically significant greater proportion of patients treated with upadacitinib 15 mg achieved ACR20 response compared to placebo at week 12 (Table 8). Time to onset of efficacy was rapid across measures with greater responses seen as early as week 2 for ACR20.

Treatment with upadacitinib 15 mg resulted in improvements in individual ACR components, including tender/painful and swollen joint counts, patient and physician global assessments, HAQ-DI, pain assessment, and hsCRP compared to placebo.

In SELECT-PsA 1, upadacitinib 15 mg achieved non-inferiority compared to adalimumab in the proportion of patients achieving ACR20 response at week 12; however, superiority to adalimumab could not be demonstrated.

In both studies, consistent responses were observed alone or in combination with methotrexate for primary and key secondary endpoints.

The efficacy of upadacitinib 15 mg was demonstrated regardless of subgroups evaluated including baseline BMI, baseline hsCRP, and number of prior non-biologic DMARDs (≤ 1 or >1).

Table 8 Clinical response in SELECT-PsA 1 and SELECT-PsA 2

Study	SELECT-PsA 1 non-biologic DMARD-IR			SELECT-PsA 2 bDMARD-IR	
	PBO	UPA 15 mg	ADA 40 mg	PBO	UPA 15 mg
N	423	429	429	212	211
ACR20, % of patients (95% CI)					
Week 12	36 (32, 41)	71 (66, 75) ^f	65 (61, 70)	24 (18, 30)	57 (50, 64)
Difference from placebo (95% CI)	35 (28, 41) ^{d,e}		-	33 (24, 42) ^{d,e}	
Week 24	45 (40, 50)	73 (69, 78)	67 (63, 72)	20 (15, 26)	59 (53, 66)
Week 56		74 (70, 79)	69 (64, 73)		60 (53, 66)
ACR50, % of patients (95% CI)					
Week 12	13 (10, 17)	38 (33, 42)	38 (33, 42)	5 (2, 8)	32 (26, 38)
Week 24	19 (15, 23)	52 (48, 57)	44 (40, 49)	9 (6, 13)	38 (32, 45)

Week 56		60 (55, 64)	51 (47, 56)		41 (34, 47)
ACR70, % of patients (95% CI)					
Week 12	2 (1, 4)	16 (12, 19)	14 (11, 17)	1 (0, 1)	9 (5, 12)
Week 24	5 (3, 7)	29 (24, 33)	23 (19, 27)	1 (0, 2)	19 (14, 25)
Week 56		41 (36, 45)	31 (27, 36)		24 (18, 30)
MDA, % of patients (95% CI)					
Week 12	6 (4, 9)	25 (21, 29)	25 (21, 29)	4 (2, 7)	17 (12, 22)
Week 24	12 (9, 15)	37 (32, 41) ^e	33 (29, 38)	3 (1, 5)	25 (19, 31) ^e
Week 56		45 (40, 50)	40 (35, 44)		29 (23, 36)
Resolution of enthesitis (LEI=0), % of patients (95% CI)^a					
Week 12	33 (27, 39)	47 (42, 53)	47 (41, 53)	20 (14, 27)	39 (31, 47)
Week 24	32 (27, 39)	54 (48, 60) ^e	47 (42, 53)	15 (9, 21)	43 (34, 51)
Week 56		59 (53, 65)	54 (48, 60)		43 (34, 51)
Resolution of dactylitis (LDI=0), % of patients (95% CI)^b					
Week 12	42 (33, 51)	74 (66, 81)	72 (64, 80)	36 (24, 48)	64 (51, 76)
Week 24	40 (31, 48)	77 (69, 84)	74 (66, 82)	28 (17, 39)	58 (45, 71)
Week 56		75 (68, 82)	74 (66, 82)		51 (38, 64)
PASI75, % of patients (95% CI)^c					
Week 16	21 (16, 27)	63 (56, 69) ^e	53 (46, 60)	16 (10, 22)	52 (44, 61) ^e
Week 24	27 (21, 33)	64 (58, 70)	59 (52, 65)	19 (12, 26)	54 (45, 62)
Week 56		65 (59, 72)	61 (55, 68)		52 (44, 61)
PASI90, % of patients (95% CI)^c					
Week 16	12 (8, 17)	38 (32, 45)	39 (32, 45)	8 (4, 13)	35 (26, 43)
Week 24	17 (12, 22)	42 (35, 48)	45 (38, 52)	7 (3, 11)	36 (28, 44)
Week 56		49 (42, 56)	47 (40, 54)		41 (32, 49)
Abbreviations: ACR20 (or 50 or 70) = American College of Rheumatology $\geq 20\%$ (or $\geq 50\%$ or $\geq 70\%$) improvement, ADA = adalimumab; bDMARD = biologic disease-modifying anti-rheumatic drug; IR = inadequate responder; MDA = minimal disease activity; PASI75 (or 90) = $\geq 75\%$ (or $\geq 90\%$) improvement in Psoriasis Area and Severity Index; PBO = placebo; UPA= upadacitinib Patients who discontinued randomised treatment or were missing data at week of evaluation were imputed as non-responders in the analyses. For MDA, resolution of enthesitis, and resolution of dactylitis at week 24/56, the subjects rescued at week 16 were imputed as non-responders in the analyses. ^a In patients with enthesitis at baseline (n=241, 270, and 265, respectively, for SELECT-PsA 1 and n=144 and 133, respectively, for SELECT-PsA 2) ^b In patients with dactylitis at baseline (n=126, 136, and 127, respectively, for SELECT-PsA 1 and n=64 and 55, respectively, for SELECT-PsA 2) ^c In patients with $\geq 3\%$ BSA psoriasis at baseline (n=211, 214, and 211, respectively, for SELECT-PsA 1 and n=131 and 130, respectively, for SELECT-PsA 2) ^d primary endpoint ^e multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo comparison ^f multiplicity-controlled $p \leq 0.001$ upadacitinib vs adalimumab comparison (non-inferiority test)					

Radiographic response

In SELECT-PsA 1, inhibition of progression of structural damage was assessed radiographically and expressed as the change from baseline in modified Total Sharp Score (mTSS) and its components, the erosion score and the joint space narrowing score, at week 24.

Treatment with upadacitinib 15 mg resulted in statistically significant greater inhibition of the progression of structural joint damage compared to placebo at week 24 (Table 9). Erosion and joint space narrowing scores were consistent with the overall scores. The proportion of patients with no

radiographic progression (mTSS change ≤ 0.5) was higher with upadacitinib 15 mg compared to placebo at week 24.

Table 9 Radiographic changes in SELECT-PsA 1

Treatment Group	PBO	UPA 15 mg	ADA 40 mg
Modified Total Sharp Score, mean change from baseline (95% CI)			
Week 24	0.25 (0.13, 0.36)	-0.04 (-0.16, 0.07) ^c	0.01 (-0.11, 0.13)
Week 56 ^a	0.44 (0.29, 0.59)	-0.05 (-0.20, 0.09)	-0.06 (-0.20, 0.09)
Proportion of patients with no radiographic progression^b, % (95% CI)			
Week 24	92 (89, 95)	96 (94, 98)	95 (93, 97)
Week 56 ^a	89 (86, 92)	97 (96, 99)	94 (92, 97)
Abbreviations: ADA = adalimumab; PBO = placebo; UPA= upadacitinib			
^a All placebo data at week 56 derived using linear extrapolation			
^b No progression defined as mTSS change ≤ 0.5			
^c multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo comparison			

Physical function response and health-related outcomes

In SELECT-PsA 1, patients treated with upadacitinib 15 mg showed statistically significant improvement from baseline in physical function as assessed by HAQ-DI at week 12 (-0.42 [95% CI: -0.47, -0.37]) compared to placebo (-0.14 [95% CI: -0.18, -0.09]); improvement in patients treated with adalimumab was -0.34 (95% CI: -0.38, -0.29). In SELECT-PsA 2, patients treated with upadacitinib 15 mg showed statistically significant improvement from baseline in HAQ-DI at week 12 (-0.30 [95% CI: -0.37, -0.24]) compared to placebo (-0.10 [95% CI: -0.16, -0.03]). Improvement in physical function was maintained through week 56 in both studies.

Health-related quality of life was assessed by SF-36v2. In both studies, patients receiving upadacitinib 15 mg experienced statistically significant greater improvement from baseline in the Physical Component Summary score compared to placebo at week 12. Improvements from baseline were maintained through week 56 in both studies.

Patients receiving upadacitinib 15 mg experienced statistically significant improvement from baseline in fatigue, as measured by FACIT-F score, at week 12 compared to placebo in both studies. Improvements from baseline were maintained through week 56 in both studies.

At baseline, psoriatic spondylitis was reported in 31% and 34% of patients in SELECT-PsA 1 and SELECT-PsA 2, respectively. Patients with psoriatic spondylitis treated with upadacitinib 15 mg showed improvements from baseline in Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) scores compared to placebo at week 24. Improvements from baseline were maintained through week 56 in both studies.

Axial spondyloarthritis

Non-radiographic axial spondyloarthritis

The efficacy and safety of upadacitinib 15 mg once daily were assessed in a randomised, double-blind, multicentre, placebo-controlled study in patients 18 years of age or older with active non-radiographic axial spondyloarthritis. Study SELECT-AXIS 2 (nr-axSpA) was a 52-week placebo-controlled trial in 314 patients with active non-radiographic axial spondyloarthritis with an inadequate response to at least two NSAIDs or intolerance to or contraindication for NSAIDs. Patients must have had objective signs of inflammation indicated by elevated C-reactive protein (CRP) (defined as $>$ upper limit of normal), and/or sacroiliitis on magnetic resonance imaging (MRI), and no definitive radiographic

evidence of structural damage on sacroiliac joints. Patients had active disease as defined by the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) ≥ 4 , and a Patient's Assessment of Total Back Pain score ≥ 4 based on a 0 – 10 numerical rating scale (NRS) at the Screening and Baseline Visits. At baseline, patients had symptoms of non-radiographic axial spondyloarthritis for an average of 9.1 years and 29.1% of the patients were on a concomitant csDMARD. 32.9% of the patients had an inadequate response or intolerance to bDMARD therapy. Patients received upadacitinib 15 mg once daily or placebo. At week 52, all patients randomised to placebo were switched to upadacitinib 15 mg once daily. The primary endpoint was the proportion of patients achieving an Assessment of SpondyloArthritis international Society 40 (ASAS40) response at week 14. The study included a long-term extension for up to 2 years. Of patients who were initially randomised to upadacitinib, 75% (117/156) in SELECT-AXIS 2 (nr-axSpA) continued therapy through 2 years.

Clinical response

In SELECT-AXIS 2 (nr-axSpA), a significantly greater proportion of patients treated with upadacitinib 15 mg achieved an ASAS40 response compared to placebo at week 14 (Table 10). A numerical difference between treatment groups was observed at all timepoints from week 2 to week 14.

Treatment with upadacitinib 15 mg resulted in improvements in individual ASAS components (patient global assessment of disease activity, total back pain assessment, inflammation, and function) and other measures of disease activity, including hsCRP, compared to placebo at week 14.

The efficacy of upadacitinib 15 mg was demonstrated across subgroups including gender, baseline BMI, symptom duration of non-radiographic axial spondyloarthritis, baseline hsCRP, MRI sacroiliitis, and prior use of bDMARDs.

Table 10 Clinical response in SELECT-AXIS 2 (nr-axSpA)

Treatment Group	PBO	UPA 15 mg
N	157	156
ASAS40, % of patients (95% CI)^a		
Week 14	22.5 (16.0, 29.1)	44.9 (37.1, 52.7)
Difference from placebo (95% CI)	22.2 (12.1, 32.3) ^b	
Week 52	42.7 (34.9, 50.4)	62.8 (55.2, 70.4) ^d
ASAS20, % of patients (95% CI)^a		
Week 14	43.8 (36.0, 51.5)	66.7 (59.3, 74.1) ^b
ASAS Partial Remission, % of patients (95% CI)		
Week 14	7.6 (3.5, 11.8)	18.6 (12.5, 24.7) ^c
BASDAI 50, % of patients (95% CI)		
Week 14	22.1 (15.5, 28.6)	42.3 (34.6, 50.1) ^b
Change from baseline in ASDAS-CRP (95% CI)		
Week 14	-0.71 (-0.85, -0.56)	-1.36 (-1.50, -1.21) ^b
ASDAS Inactive Disease, % of patients (95% CI)		
Week 14	5.2 (1.7, 8.7)	14.1 (8.6, 19.6) ^c
ASDAS Low Disease Activity, % of patients (95% CI)		
Week 14	18.3 (12.2, 24.4)	42.3 (34.6, 50.1) ^b
Abbreviations: ASAS20 (or ASAS40) = Assessment of SpondyloArthritis international Society $\geq 20\%$ (or $\geq 40\%$) improvement; ASDAS-CRP = Ankylosing Spondylitis Disease Activity Score C-Reactive Protein; BASDAI = Bath Ankylosing Spondylitis Disease Activity Index; PBO = placebo; UPA= upadacitinib		
^a An ASAS20 (ASAS40) response is defined as a $\geq 20\%$ ($\geq 40\%$) improvement and an absolute improvement from baseline of ≥ 1 (≥ 2) unit(s) (range 0 to 10) in ≥ 3 of 4 domains (Patient Global, Total Back Pain, Function, and Inflammation), and no worsening in the potential remaining domain (defined as worsening $\geq 20\%$ and ≥ 1 unit for ASAS20 or defined as worsening of > 0 units for		

ASAS40).

^b multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo comparison

^c multiplicity-controlled $p \leq 0.01$ upadacitinib vs placebo comparison

^d Nominal $p \leq 0.001$ for upadacitinib vs placebo comparison, according to prespecified multiplicity-controlled testing sequence

For binary endpoints, results are based on non-responder imputation in conjunction with multiple imputation. For continuous endpoints, results are based on the least squares mean change from baseline using mixed-effect models repeated measures analysis.

Efficacy was maintained through 2 years as assessed by the endpoints presented in Table 10.

Physical function response and health-related outcomes

Patients treated with upadacitinib 15 mg showed significant improvement in physical function from baseline compared to placebo as assessed by the BASFI at week 14.

Patients treated with upadacitinib 15 mg showed significant improvements in total back pain and nocturnal back pain compared to placebo at week 14.

Patients treated with upadacitinib 15 mg showed significant improvements in health-related quality of life and overall health as measured by ASQoL and ASAS Health Index, respectively, compared to placebo at week 14.

Improvements in BASFI, total and nocturnal back pain, ASQoL and ASAS Health Index were maintained through 2 years.

Objective measure of inflammation

Signs of inflammation were assessed by MRI and expressed as change from baseline in the Spondyloarthritis Research Consortium of Canada (SPARCC) score of the sacroiliac joints. At week 14, significant improvement of inflammatory signs in the sacroiliac joints was observed in patients treated with upadacitinib 15 mg compared to placebo. Improvement in inflammation as assessed by MRI was maintained through 2 years.

Ankylosing spondylitis (AS, radiographic axial spondyloarthritis)

The efficacy and safety of upadacitinib 15 mg once daily were assessed in two randomised, double-blind, multicentre, placebo-controlled studies in patients 18 years of age or older with active ankylosing spondylitis based upon the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) ≥ 4 and Patient's Assessment of Total Back Pain score ≥ 4 . Both studies included a long-term extension for up to 2 years.

SELECT-AXIS 1 was a 14-week placebo-controlled trial in 187 ankylosing spondylitis patients with an inadequate response to at least two NSAIDs or intolerance to or contraindication for NSAIDs and had no previous exposure to biologic DMARDs. At baseline, patients had symptoms of ankylosing spondylitis for an average of 14.4 years and approximately 16% of the patients were on a concomitant csDMARD. Patients received upadacitinib 15 mg once daily or placebo. At week 14, all patients randomised to placebo were switched to upadacitinib 15 mg once daily. The primary endpoint was the proportion of patients achieving an Assessment of SpondyloArthritis international Society 40 (ASAS40) response at week 14.

SELECT-AXIS 2 (AS) was a 14-week placebo-controlled trial in 420 ankylosing spondylitis patients with prior exposure to bDMARDs (77.4% had lack of efficacy to either a TNF inhibitor or interleukin-17 inhibitor (IL-17i); 30.2% had intolerance; 12.9% had prior exposure but not lack of efficacy to two bDMARDs). At baseline, patients had symptoms of ankylosing spondylitis for an average of 12.8 years and approximately 31% of the patients were on a concomitant csDMARD. Patients received upadacitinib 15 mg once daily or placebo. At week 14, all patients randomised to placebo were

switched to upadacitinib 15 mg once daily. The primary endpoint was the proportion of patients achieving an Assessment of SpondyloArthritis international Society 40 (ASAS40) response at week 14.

Of patients who were initially randomised to upadacitinib, 72% (67/93) in SELECT-AXIS 1 and 77% (163/211) in SELECT-AXIS 2 (AS) continued therapy through 2 years.

Clinical response

In both studies, a significantly greater proportion of patients treated with upadacitinib 15 mg achieved an ASAS40 response compared to placebo at week 14 (Table 11). A numerical difference between treatment groups was observed from week 2 in SELECT-AXIS 1 and week 4 in SELECT-AXIS 2 (AS) for ASAS40.

Treatment with upadacitinib 15 mg resulted in improvements in individual ASAS components (patient global assessment of disease activity, total back pain assessment, inflammation, and function) and other measures of disease activity, including hsCRP, at week 14 compared to placebo.

The efficacy of upadacitinib 15 mg was demonstrated regardless of subgroups evaluated including gender, baseline BMI, symptom duration of AS, baseline hsCRP, and prior use of bDMARDs.

Table 11 Clinical response

Study	SELECT-AXIS 1 bDMARD-naïve		SELECT-AXIS 2 (AS) bDMARD-IR	
Treatment Group	PBO	UPA 15 mg	PBO	UPA 15 mg
N	94	93	209	211
ASAS40, % of patients (95% CI) ^{a,b}				
Week 14	25.5 (16.7, 34.3)	51.6 (41.5, 61.8)	18.2 (13.0, 23.4)	44.5 (37.8, 51.3)
Difference from placebo (95% CI)	26.1 (12.6, 39.5) ^c		26.4 (17.9, 34.9) ^c	
ASAS20, % of patients (95% CI) ^a				
Week 14	40.4 (30.5, 50.3)	64.5 (54.8, 74.2) ^c	38.3 (31.7, 44.9)	65.4 (59.0, 71.8) ^c
ASAS Partial Remission, % of patients (95% CI)				
Week 14	1.1 (0.0, 3.1)	19.4 (11.3, 27.4) ^c	4.3 (1.6, 7.1)	17.5 (12.4, 22.7) ^c
BASDAI 50, % of patients (95% CI)				
Week 14	23.4 (14.8, 32.0)	45.2 (35.0, 55.3) ^d	16.7 (11.7, 21.8)	43.1 (36.4, 49.8) ^c
Change from baseline in ASDAS-CRP (95% CI)				
Week 14	-0.54 (-0.71, -0.37)	-1.45 (-1.62, -1.28) ^c	-0.49 (-0.62, -0.37)	-1.52 (-1.64, -1.39) ^c
ASDAS Inactive Disease, % of patients (95% CI)				
Week 14	0	16.1 (8.7, 23.6) ^e	1.9 (0.1, 3.8)	12.8 (8.3, 17.3) ^c
ASDAS Low Disease Activity, % of patients (95% CI)				
Week 14	10.6 (4.4, 16.9)	49.5 (39.3, 59.6) ^f	10.1 (6.0, 14.2)	44.1 (37.4, 50.8) ^c
ASDAS Major Improvement, % of patients (95% CI)				
Week 14	5.3 (0.8, 9.9)	32.3 (22.8, 41.8) ^e	4.8 (1.9, 7.7)	30.3 (24.1, 36.5) ^c

^a An ASAS20 (ASAS40) response is defined as a $\geq 20\%$ ($\geq 40\%$) improvement and an absolute improvement from baseline of ≥ 1 (≥ 2) unit(s) (range 0 to 10) in ≥ 3 of 4 domains (Patient Global, Total Back Pain, Function, and Inflammation), and no worsening in the potential remaining domain (defined as worsening $\geq 20\%$ and ≥ 1 unit for ASAS20 or defined as worsening of > 0 units for ASAS40).

^b primary endpoint

^c multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo comparison

^d multiplicity-controlled $p \leq 0.01$ upadacitinib vs placebo comparison

^e comparison not multiplicity-controlled

^f post-hoc analysis for SELECT-AXIS 1, not multiplicity-controlled

For binary endpoints, week 14 results are based on non-responder imputation (SELECT-AXIS 1) and on non-responder imputation in conjunction with multiple imputation (SELECT-AXIS 2 [AS]). For continuous endpoints, week 14 results are based on the least squares mean change from baseline using mixed models for repeated measures analysis.

In both studies, efficacy was maintained through 2 years as assessed by the endpoints presented in Table 11.

Physical function response and health-related outcomes

In both studies, patients treated with upadacitinib 15 mg showed significant improvement in physical function from baseline compared to placebo as assessed by the Bath Ankylosing Spondylitis Functional Index (BASFI) change from baseline at week 14. Improvement in BASFI was maintained through 2 years.

In SELECT-AXIS 2 (AS), patients treated with upadacitinib 15 mg showed significant improvements in total back pain and nocturnal back pain compared to placebo at week 14. Improvements in total back pain and nocturnal back pain were maintained through 2 years.

In SELECT-AXIS 2 (AS), patients treated with upadacitinib 15 mg showed significant improvements in health-related quality of life and overall health as measured by ASQoL and ASAS Health Index, respectively, compared to placebo at week 14. Improvements in ASQoL and ASAS Health Index were maintained through 2 years.

Enthesitis

In SELECT-AXIS 2 (AS), patients with pre-existing enthesitis ($n=310$) treated with upadacitinib 15 mg showed significant improvement in enthesitis compared to placebo as measured by change from baseline in Maastricht Ankylosing Spondylitis Enthesitis Score (MASES) at week 14. Improvement in enthesitis was maintained through 2 years.

Spinal mobility

In SELECT-AXIS 2 (AS), patients treated with upadacitinib 15 mg showed significant improvement in spinal mobility compared to placebo as measured by change from baseline in Bath Ankylosing Spondylitis Metrology Index (BASMI) at week 14. Improvement in BASMI was maintained through 2 years.

Objective measure of inflammation

Signs of inflammation were assessed by MRI and expressed as change from baseline in the SPARCC score for spine. In both studies at week 14, significant improvement of inflammatory signs in the spine was observed in patients treated with upadacitinib 15 mg compared to placebo. Improvement in inflammation as assessed by MRI was maintained through 2 years.

Giant cell arteritis

The efficacy and safety of upadacitinib 15 mg once daily were assessed in SELECT-GCA, a Phase 3 randomised, double-blind, multicentre, placebo-controlled study in patients 50 years of age and older with new onset or relapsing giant cell arteritis. SELECT-GCA (Period 1) was a 52-week study in which 428 patients were randomised in a 2:1:1 ratio and dosed once daily with upadacitinib 15 mg, upadacitinib 7.5 mg, or placebo. All patients received background corticosteroid (prednisone or prednisolone) therapy. The upadacitinib-treated groups followed a pre-specified corticosteroid taper regimen with the aim to reach 0 mg by 26 weeks; the placebo-treated group followed a pre-specified corticosteroid taper regimen with the aim to reach 0 mg by 52 weeks. The primary endpoint was the proportion of patients achieving sustained remission at week 52 as defined by the absence of giant cell arteritis signs and symptoms from week 12 through week 52 and adherence to the protocol-defined corticosteroid taper regimen. Patients who prematurely discontinued study treatment (upadacitinib or placebo) or had a missing assessment were classified as non-responders. The study included a 52-week blinded extension (Period 2) for a total study duration of up to 2 years.

Clinical response

Upadacitinib 15 mg and a 26-week corticosteroid taper showed superiority in achieving corticosteroid-free sustained remission at week 52 compared to placebo and a 52-week corticosteroid taper (Table 12). Results for each component of sustained remission and sustained complete remission at week 52 were consistent with those of the composite endpoints. For sustained remission at week 52 (the primary endpoint), a similar percentage of patients in each arm were classified as non-responders due to premature discontinuation of study treatment (placebo: 19.6%; upadacitinib 15 mg: 20.1%) or due to a missing assessment (placebo: 0.9%; upadacitinib 15 mg: 0.5%).

Treatment effects in subgroups (gender, age, race, prior use of interleukin-6 inhibitor, new onset or relapsing giant cell arteritis, baseline corticosteroid dose, and giant cell arteritis with or without polymyalgia rheumatica) were consistent with the results in the overall study population.

A significantly lower proportion of patients treated with upadacitinib 15 mg and a 26-week corticosteroid taper experienced at least one giant cell arteritis flare compared to those treated with placebo and a 52-week corticosteroid taper through week 52. In addition, the risk of flare in the upadacitinib arm was significantly lower compared to the placebo arm as measured by time to first flare through week 52 (Table 12).

Table 12 Clinical response in SELECT-GCA (Period 1)

Treatment Group	PBO + 52-week corticosteroid taper N=112	UPA 15 mg + 26-week corticosteroid taper N=209	Treatment Difference (95% CI)
Sustained remission at Week 52 ^a	29.0%	46.4%	17.1% ^e (6.3, 27.8)
Sustained complete remission at Week 52 ^b	16.1%	37.1%	20.7% ^f (11.3, 30.2)
Complete remission at Week 52 ^c	19.6%	50.2%	30.3% ^f (20.4, 40.2)
Complete remission at Week 24 ^c	36.1%	57.2%	20.8% ^f (9.7, 31.9)
Time to first GCA flare through Week 52 ^d			0.57 ^{e,g} (0.399, 0.826)
Patients with one or more GCA flares through Week 52 ^d	55.6%	34.3%	0.47 ^{e,h} (0.29, 0.74)
Abbreviations: ESR = erythrocyte sedimentation rate; GCA = giant cell arteritis; hsCRP = high sensitivity C-reactive protein; PBO = placebo; UPA = upadacitinib ^a Sustained remission is defined as having achieved both the absence of GCA signs and symptoms from Week 12 through Week 52 and adherence to the protocol-defined corticosteroid taper regimen ^b Sustained complete remission is defined as having achieved absence of GCA signs and symptoms from Week 12 through Week 52, normalization of ESR (to ≤ 30 mm/hr; if ESR > 30 mm/hr and elevation is not attributable to GCA, this criterion can still be met) from Week 12 through Week 52, normalization of hsCRP to < 1 mg/dL without elevation to ≥ 1 mg/dL (on 2 consecutive visits) from Week 12 through Week 52, and adherence to the protocol-defined corticosteroid taper regimen ^c Complete remission is defined as having achieved absence of GCA signs and symptoms, normalization of ESR (to ≤ 30 mm/hr; if ESR > 30 mm/hr and elevation is not attributable to GCA, this criterion can still be met), normalization of hsCRP to < 1 mg/dL, and adherence to the protocol-defined corticosteroid taper regimen ^d GCA flare is defined as an event representing recurrence of GCA signs or symptoms or an ESR measurement > 30 mm/hr (attributable to GCA) and requiring an increase in corticosteroid dose, and is only considered after all of the 3 following criteria are met: absence of recurrence of GCA signs and symptoms, normalization of ESR, and no corticosteroid dose increase. Subjects who do not have an assessment that meets all 3 criteria are considered as having a GCA flare at baseline. Time to first GCA flare is calculated from the time when all three criteria above are met. Subjects who meet all 3 criteria above but never experience GCA flare are censored at the last assessment ^e $p \leq 0.01$ ^f $p \leq 0.001$ ^g Hazard ratio ^h Odds ratio			

Cumulative corticosteroid dose

Among patients who completed 52 weeks of follow-up, the cumulative corticosteroid exposure at week 52 was significantly lower in patients treated with upadacitinib 15 mg and a 26-week corticosteroid taper compared to placebo and a 52-week corticosteroid taper (median 1615 mg vs 2882 mg, respectively). The comparison of cumulative corticosteroid dose between the upadacitinib arm and the placebo arm is affected by the different pre-specified regimens for steroid tapering in the upadacitinib arm versus the placebo arm.

Health-related outcomes

Fatigue was assessed using FACIT-Fatigue score. Patients treated with upadacitinib 15 mg and a 26-week corticosteroid taper experienced significantly greater improvement from baseline compared to placebo and a 52-week corticosteroid taper in FACIT-Fatigue score at week 52 (4.0, 95% CI: 1.33, 6.76).

Health-related quality of life was assessed using SF-36. Patients receiving upadacitinib 15 mg and a 26-week corticosteroid taper experienced significantly greater improvement from baseline compared to placebo and a 52-week corticosteroid taper in the Physical Component Summary score of SF-36 at week 52 (3.75, 95% CI: 1.39, 6.11).

Maintenance of response

A total of 223 patients entered the blinded extension period (Period 2), of the SELECT-GCA study. Patients originally randomised to upadacitinib 15 mg in Period 1, and who achieved sustained remission (defined by the absence of giant cell arteritis signs and symptoms and being corticosteroid free) for at least 24 weeks prior to week 52, were re-randomised to continue upadacitinib 15 mg (N = 68) or placebo (N = 35).

Among patients who achieved sustained remission at week 52, 71.7% of patients re-randomised to continue treatment with upadacitinib 15 mg maintained corticosteroid-free remission through week 104 compared to 31.4% of patients re-randomised to placebo.

Among those patients who were re-randomised to placebo, 59.5% experienced a giant cell arteritis flare, compared to 7.4% of patients re-randomised to continue upadacitinib 15 mg. The median time to flare was 113 days for patients re-randomised to placebo and was greater than 365 days (median not reached) for patients re-randomised to upadacitinib 15 mg.

Atopic dermatitis

The efficacy and safety of upadacitinib 15 mg and 30 mg once daily were assessed in three Phase 3 randomised, double-blind, multicentre studies (MEASURE UP 1, MEASURE UP 2 and AD UP) in a total of 2782 patients (12 years of age and older). Upadacitinib was evaluated in 542 (344 in the primary analysis) adolescent and 2240 adult patients with moderate to severe atopic dermatitis (AD) not adequately controlled by topical medication(s). At baseline, patients had to have all the following: an Investigator's Global Assessment (vIGA-AD) score ≥ 3 in the overall assessment of AD (erythema, induration/papulation, and oozing/crusting) on an increasing severity scale of 0 to 4, an Eczema Area and Severity Index (EASI) score ≥ 16 (composite score assessing extent and severity of erythema, oedema/papulation, scratches and lichenification across 4 different body sites), a minimum body surface area (BSA) involvement of $\geq 10\%$, and weekly average Worst Pruritus Numerical Rating Scale (NRS) ≥ 4 .

In all three studies, patients received upadacitinib once daily doses of 15 mg, 30 mg, or matching placebo for 16 weeks. In the AD UP study, patients also received concomitant topical corticosteroids (TCS). Following completion of the double blinded period, patients originally randomised to

upadacitinib were to continue receiving the same dose until week 260. Patients in the placebo group were re-randomised in a 1:1 ratio to receive upadacitinib 15 mg or 30 mg until week 260.

Baseline characteristics

In the monotherapy studies (MEASURE UP 1 and 2), 50.0% of patients had a baseline vIGA-AD score of 3 (moderate) and 50.0% of patients had a baseline vIGA-AD of 4 (severe). The mean baseline EASI score was 29.3 and the mean baseline weekly average Worst Pruritus NRS was 7.3. In the concomitant TCS study (AD UP), 47.1% of patients had a baseline vIGA-AD score of 3 (moderate) and 52.9% of patients had a baseline vIGA-AD of 4 (severe). The mean baseline EASI score was 29.7 and the mean baseline weekly average Worst Pruritus NRS was 7.2.

Clinical response

Monotherapy (MEASURE UP 1 AND MEASURE UP 2) and Concomitant TCS (AD UP) studies

A significantly greater proportion of patients treated with upadacitinib 15 mg or 30 mg achieved vIGA-AD 0 or 1, EASI 75, or a ≥ 4 -point improvement on the Worst Pruritus NRS compared to placebo at week 16. Rapid improvements in skin clearance and itch were also achieved (see Table 13).

Figure 1 shows the proportion of patients achieving an EASI 75 response and mean percent change from baseline in Worst Pruritus NRS, respectively up to week 16 for MEASURE UP 1 and 2.

Table 13 Efficacy results of upadacitinib

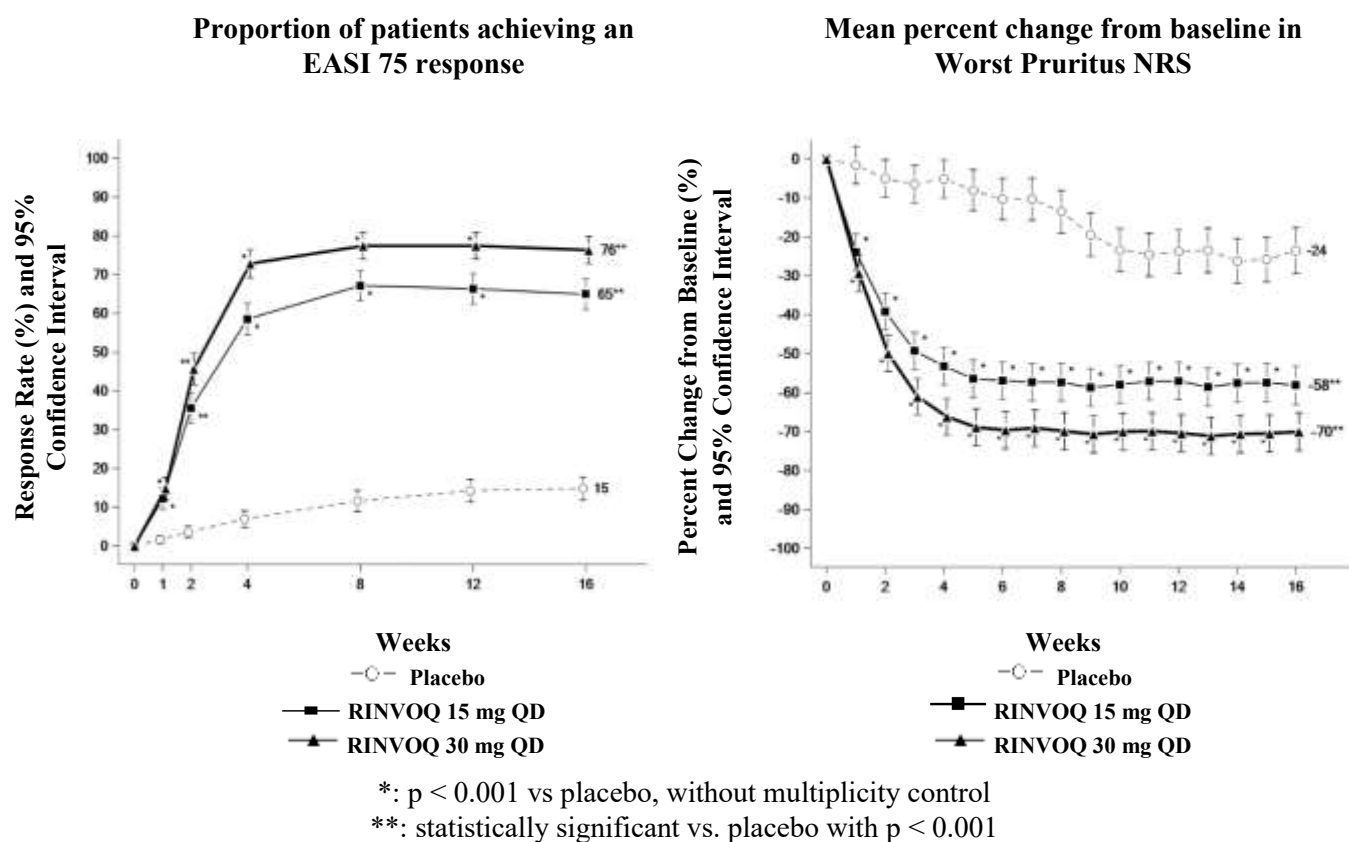
Study	MEASURE UP 1			MEASURE UP 2			AD UP		
Treatment Group	PBO	UPA 15 mg	UPA 30 mg	PBO	UPA 15 mg	UPA 30 mg	PBO + TCS	UPA 15 mg + TCS	UPA 30 mg + TCS
Number of subjects randomised	281	281	285	278	276	282	304	300	297
Week 16 endpoints, % responders (95% CI)									
vIGA-AD 0/1 ^{a,b} (co-primary)	8 (5,12)	48 ^d (42,54)	62 ^d (56,68)	5 (2,7)	39 ^d (33,45)	52 ^d (46,58)	11 (7,14)	40 ^d (34,45)	59 ^d (53,64)
EASI 75 ^a (co-primary)	16 (12,21)	70 ^d (64,75)	80 ^d (75,84)	13 (9,17)	60 ^d (54,66)	73 ^d (68,78)	26 (21,31)	65 ^d (59,70)	77 ^d (72,82)
EASI 90 ^a	8 (5,11)	53 ^d (47,59)	66 ^d (60,71)	5 (3,8)	42 ^d (37,48)	58 ^d (53,64)	13 (9,17)	43 ^d (37,48)	63 ^d (58,69)
EASI 100 ^a	2 (0,3)	17 ^d (12,21)	27 ^d (22,32)	1 (0,2)	14 ^d (10,18)	19 ^d (14,23)	1 (0,3)	12 ^e (8,16)	23 ^d (18,27)
Worst Pruritus NRS ^c (≥ 4 -point improvement)	12 (8,16)	52 ^d (46,58)	60 ^d (54,66)	9 (6,13)	42 ^d (36,48)	60 ^d (54,65)	15 (11,19)	52 ^d (46,58)	64 ^d (58,69)

Early onset endpoints, % responders (95% CI)									
EASI 75 ^a (Week 2)	4 (1,6)	38 ^d (32,44)	47 ^d (42,53)	4 (1,6)	33 ^d (27,39)	44 ^d (38,50)	7 (4,10)	31 ^d (26,36)	44 ^d (38,50)
Worst Pruritus NRS (≥ 4 -point improvement at week 1) ^{c,f}	0 (0,1)	15 ^d (11,19)	20 ^d (15,24)	1 (0,2)	7 ^d (4,11)	16 ^d (11,20)	3 (1,5)	12 ^d (8,16)	19 ^d (15,24)

Abbreviations: UPA= upadacitinib (RINVOQ); PBO = placebo
Subjects with rescue medication or with missing data were counted as non-responders. The number and percentage of subjects who were imputed as non-responders for EASI 75 and vIGA-AD 0/1 at Week 16 due to the use of rescue therapy in the placebo, upadacitinib 15 mg, and upadacitinib 30 mg groups, respectively, were 132 (47.0%), 31 (11.0%), 16 (5.6%) in MEASURE UP 1, 119 (42.8%), 24 (8.7%), 16 (5.7%) in MEASURE UP 2, and 78 (25.7%), 15 (5.0%), 14 (4.7%) in AD UP.

^a Based on number of subjects randomised
^b Responder was defined as a patient with vIGA-AD 0 or 1 (“clear” or “almost clear”) with a reduction of ≥ 2 points on a 0-4 ordinal scale
^c Results shown in subset of patients eligible for assessment (patients with Worst Pruritus NRS ≥ 4 at baseline)
^d Statistically significant vs. placebo with $p < 0.001$
^e $p < 0.001$ vs placebo, without multiplicity control
^f Statistically significant improvements vs placebo were seen as early as 1 day after initiating upadacitinib 30 mg and 2 days after initiating upadacitinib 15 mg in MEASURE UP 1 and 2

Figure 1 Proportion of patients achieving an EASI 75 response and mean percent change from baseline in Worst Pruritus NRS in MEASURE UP 1 and MEASURE UP 2



Treatment effects in subgroups (weight, age, gender, race, and prior systemic treatment with immunosuppressants) were consistent with the results in the overall study population.

Results at week 16 continued to be maintained through week 260 in patients treated with upadacitinib 15 mg or 30 mg.

Quality of life/patient-reported outcomes

Table 14 Patient-reported outcomes results of upadacitinib at week 16

Study	MEASURE UP 1			MEASURE UP 2		
Treatment group	PBO	UPA 15 mg	UPA 30 mg	PBO	UPA 15 mg	UPA 30 mg
Number of subjects randomised	281	281	285	278	276	282
% responders (95% CI)						
ADerm-SS Skin Pain (≥ 4 -point improvement) ^a	15 (10,20)	54 ^e (47,60)	63 ^e (57,69)	13 (9,18)	49 ^e (43,56)	65 ^e (59,71)
ADerm-IS Sleep (≥ 12 -point improvement) ^{a,b}	13 (9,18)	55 ^e (48,62)	66 ^e (60,72)	12 (8,17)	50 ^e (44,57)	62 ^e (56,69)
DLQI 0/1 ^c	4 (2,7)	30 ^e (25,36)	41 ^e (35,47)	5 (2,7)	24 ^e (19,29)	38 ^e (32,44)
HADS Anxiety <8 and HADS Depression < 8 ^d	14 (8,20)	46 ^e (37,54)	49 ^e (41,57)	11 (6,17)	46 ^e (38,54)	56 ^e (48,64)
Abbreviations: UPA= upadacitinib (RINVOQ); PBO = placebo; DLQI = Dermatology Life Quality Index; HADS = Hospital Anxiety and Depression Scale Subjects with rescue medication or with missing data were counted as non-responders. The threshold values specified correspond to the minimal clinically important difference (MCID) and was used to determine response. ^a Results shown in subset of patients eligible for assessment (patients with assessment score > MCID at baseline). ^b ADerm-IS Sleep assesses difficulty falling asleep, sleep impact, and waking up at night due to AD. ^c Results shown in subset of patients eligible for assessment (patients with DLQI > 1 at baseline). ^d Results shown in subset of patients eligible for assessment (patients with HADS Anxiety ≥ 8 or HADS Depression ≥ 8 at baseline) ^e Statistically significant vs. placebo with $p < 0.001$						

Alopecia areata

The efficacy and safety of upadacitinib 15 mg and 30 mg once daily were assessed in two identical Phase 3 randomised, double-blind, multicentre studies, AA-1 (UP-AA-1) and AA-2 (UP-AA-2), in a total of 1399 patients between 12 to 64 years of age (1281 adults and 118 adolescents) with at least 50% scalp hair loss (severe alopecia areata) as measured by the Severity of Alopecia Tool (SALT), including patients with alopecia totalis and alopecia universalis. Concomitant therapies for the treatment of alopecia areata were not allowed.

In both studies, patients received upadacitinib once daily doses of 15 mg, 30 mg or matching placebo for 24 weeks. Patients originally randomised to 15 mg or 30 mg continued on the same dose to week 52. Patients originally randomised to placebo who did not achieve a clinical response (SALT score ≤ 20) at week 24, were re-randomised to upadacitinib 15 mg or 30 mg; patients originally randomised to placebo who achieved SALT score ≤ 20 at week 24 would continue with placebo to week 52. At week 40, patients not achieving at least a 30% improvement in SALT score were assigned open-label

upadacitinib 30 mg. Upon completion of these 52-week trials, patients were eligible to continue in a long-term extension study in which dose-optimisation was studied up to 160 weeks.

The primary endpoint for the studies was the achievement of at least 80% scalp hair coverage (SALT score ≤ 20) at week 24.

Key multiplicity-controlled secondary endpoints included achievement of at least 90% scalp hair coverage (SALT score ≤ 10), achievement of complete scalp hair regrowth (SALT score of 0), significant improvement in measures for eyebrow and eyelash hair loss, and Skindex-16 AA emotions and functioning domain scores at week 24.

Baseline characteristics

Across the studies, the mean age was 36 years, 59% of patients were female, 62% were White, 30% were Asian, and 6% were Black. The mean baseline SALT score was 84 (84% scalp hair loss), and 51% of patients had at least 95% scalp hair loss. At baseline, 66% of patients had either significant gaps or uneven distribution or complete eyebrow hair loss and similarly 55% had either significant gaps or uneven spacing or complete eyelash hair loss, as measured by Clinician-Reported Outcome (ClinRO) Measures for eyebrow and eyelash scores of 2 or 3. The mean duration of alopecia areata (AA) since diagnosis and the mean duration of the current episode of hair loss were 10 and 3 years, respectively. Eligible patients had no spontaneous scalp hair regrowth over the past 6 months, and a current episode of alopecia areata of less than 8 years. Approximately 84% of patients had received at least one treatment for AA at some point before entering the studies, and 64% at least one systemic medication.

Clinical response

In AA-1 and AA-2, a significantly greater proportion of patients treated with upadacitinib 15 mg or 30 mg achieved SALT score ≤ 20 compared to placebo at week 24. The results of primary and key multiplicity-controlled secondary endpoints are provided in Tables 15 and 16. Statistically significant differences in SALT score ≤ 20 were seen as early as week 8 with upadacitinib 15 mg and 30 mg compared to placebo (Figure 2).

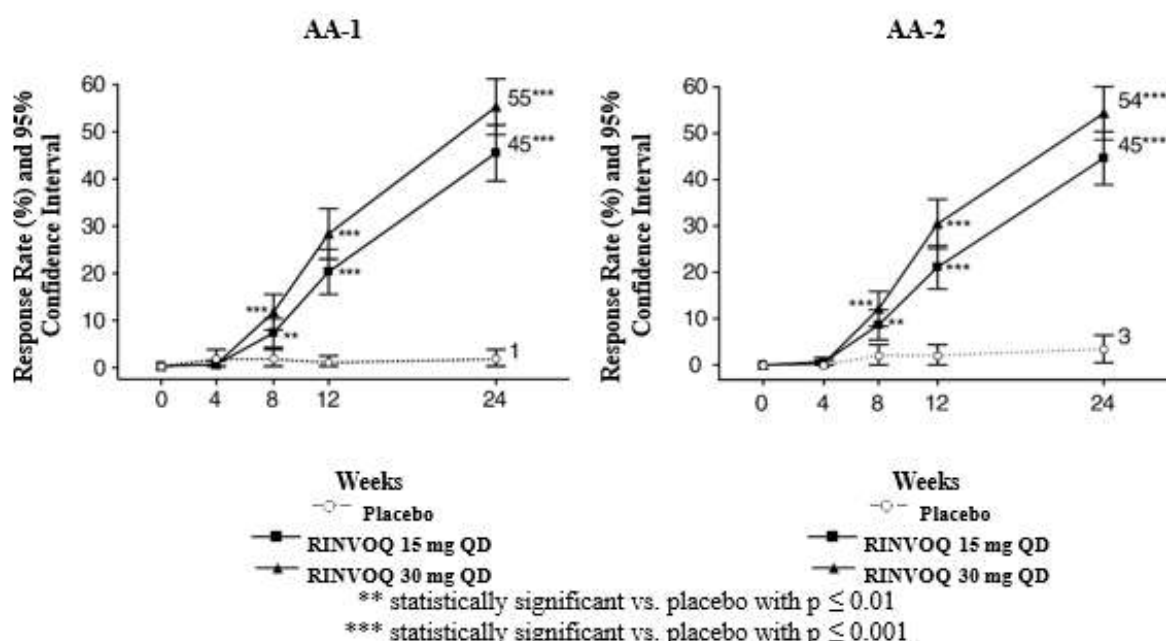
Improvements in regrowth of eyebrows, eyelashes, and beard (Table 15) were seen at week 24 among patients with substantial facial hair loss at baseline.

Table 15. Efficacy results of upadacitinib studies

Study	AA-1			AA-2		
	PBO N= 135	UPA 15 mg N= 270	UPA 30 mg N= 271	PBO N= 145	UPA 15 mg N= 289	UPA 30 mg N=289
Week 24 Endpoints						
SALT score ≤ 20	1%	45% ^d	55% ^d	3%	45% ^d	54% ^d
SALT score ≤ 10	1%	35% ^d	46% ^d	1%	36% ^d	47% ^d
SALT score of 0	0	14% ^d	20% ^d	1%	13% ^d	22% ^d
ClinRO Eyebrow Hair Loss score of 0 or 1 ^a	1% N=87	41% ^d N=170	62% ^d N=178	3% N=93	42% ^d N=192	59% ^d N=197
ClinRO Eyelash Hair Loss score of 0 or 1 ^b	6% N=72	44% ^d N=151	59% ^d N=145	4% N=82	43% ^d N=166	61% ^d N=158

ClinRO for Beard Hair Loss (I-ALFA) ^c	0 N=34	27% ^f N=67	42% ^f N=73	2% N=44	37% ^f N=76	42% ^f N=72
Week 8 Endpoint						
SALT score of ≤ 20	1%	7% ^e	11% ^d	2%	9% ^e	12% ^d
^a ClinRO assessment for eyebrow hair loss uses a 4-point response scale, ranging from 0 to 3 where 0 = The eyebrows have full coverage and no areas of hair loss; 1 = There are minimal gaps in eyebrow hair and distribution is even; 2 = There are significant gaps in eyebrow hair or distribution is not even; 3 = No notable eyebrows. The endpoint measured the proportion of subjects achieving a score of 0 or 1 with a ≥ 2 -point improvement from baseline among subjects with baseline score ≥ 2 ^b ClinRO assessment for eyelash hair loss uses a 4-point response scale, ranging from 0 to 3 where 0 = The eyelashes form a continuous line along the eyelids on both eyes; 1 = There are minimal gaps and the eyelashes are evenly spaced along the eyelids on both eyes; 2 = There are significant gaps along the eyelids or the eyelashes are not evenly spaced along the eyelids; 3 = No notable eyelashes. The endpoint measured the proportion of subjects achieving a score of 0 or 1 with a ≥ 2 -point improvement from baseline among subjects with baseline score ≥ 2 ^c ClinRO for beard hair loss (I-ALFA) uses a 4-point scale ranging from 0 = no hair growth, 1 = mostly areas with hair loss, some areas of hair growth; 2 = mostly normal hair growth, some areas of hair loss to 3 = normal hair growth. This measured the proportion of patients who achieved a grade of 2 or 3 with ≥ 2 -point improvement from Baseline among subjects with Baseline grade < 2 . ^d multiplicity-controlled $p < 0.001$ upadacitinib vs placebo comparison ^e multiplicity-controlled $p < 0.01$ upadacitinib vs placebo comparison ^f nominal $p < 0.001$ upadacitinib vs placebo comparison						

Figure 2. SALT ≤ 20 Response through week 24



Treatment effects in subgroups (gender, weight, race, geographic region, duration of current episode, disease severity, and prior pharmacologic treatment) in both studies were consistent with the results in the overall study population. Treatment effects at Week 24 in adolescents 12 to less than 18 years of age were consistent with the results observed in the overall study population.

Results at week 24 were maintained or improved in patients who continued upadacitinib 15 mg or 30 mg treatment after week 24.

Table 16. Patient-reported outcomes results of upadacitinib studies at week 24

Study	AA-1			AA-2		
	PBO N=135	UPA 15 mg N=270	UPA 30 mg N=271	PBO N=145	UPA 15 mg N=289	UPA 30 mg N=289
CFB in Skindex-16 AA Emotions Domain scores ^a	-15	-30 ^b	-36 ^b	-10	-31 ^b	-34 ^b
CFB in Skindex-16 AA Functioning Domain scores ^a	-9	-22 ^b	-25 ^b	-7	-23 ^b	-23 ^b
The threshold values specified correspond to the clinically meaningful changes and was used to determine response. CFB = Change from Baseline ^a Skindex-16 for AA measures the effects of AA on a subject's health-related quality of life, with 3 domains including Emotions, Symptoms, and Functioning. Total scores range from 0 to 100, with higher scores indicating worse health-related quality of life. ^b multiplicity-controlled $p < 0.001$ upadacitinib vs placebo comparison						

Vitiligo

The efficacy and safety of upadacitinib 15 mg once daily were assessed in two replicate Phase 3 randomised, double-blind, placebo-controlled, multicentre studies (VITI-UP-1 and VITI-UP-2) in a total of 614 patients 12 years of age and older (561 adults and 53 adolescents) with vitiligo with baseline Facial Vitiligo Area Scoring Index (F-VASI) ≥ 0.5 and baseline Total Vitiligo Area Scoring Index (T-VASI) ≥ 5 .

In both studies, disease extent at baseline ranged from F-VASI 0.5 to 3 and T-VASI 5 to 57.5. The mean age was 44.5 years (8.6% of patients were 12 to 17 years of age and 9.0% were 65 years of age or older), 50.0% of patients were female, 79.1% were White, 3.8% were Black, and 16.0% were Asian. Fitzpatrick skin types included I (2.9%), II (25.9%), III (39.3%), IV (24.6%), V (5.9%), or VI (1.5%). Actively progressing vitiligo (defined as new or expanding lesions within 6 months prior to baseline, or at least 1 lesion of confetti-like depigmentation, trichrome pattern, and/or Koebner phenomenon Type 2B) was present in 62.2% of patients. The mean time since diagnosis of vitiligo was 16.2 years prior to patients enrolling in the trials.

In both studies, patients received upadacitinib 15 mg once daily or placebo. Both studies included a 48-week placebo-controlled, double-blind treatment period (Period A) and a 112-week open-label extension period (Period B).

Clinical response

The co-primary endpoints were the achievements of $\geq 75\%$ repigmentation of facial vitiligo (F-VASI 75) and $\geq 50\%$ repigmentation of total body vitiligo (T-VASI 50) from baseline at week 48. Key multiplicity-controlled secondary endpoints assessed different thresholds of repigmentation based on T-VASI and F-VASI, and stabilisation of disease extent defined as no increase from baseline in T-VASI at both week 8 and 12 among patients with actively progressing vitiligo at baseline.

In VITI-UP-1 and VITI-UP-2, significantly greater proportions of patients treated with upadacitinib 15 mg achieved each F-VASI 75 and T-VASI 50 compared to placebo at week 48 (Table 17). In VITI-UP-1 and VITI-UP-2, statistically significant differences from placebo were seen as early as week 24 for achievement of F-VASI 75 (Figure 3).

A significantly greater proportion of patients treated with upadacitinib 15 mg achieved complete or near complete facial repigmentation as assessed by F-VASI 90 compared to placebo at week 48 (Table 17).

In VITI-UP-1 and VITI-UP-2, treatment effects in subgroups (age, weight, gender, race, Fitzpatrick skin type, baseline disease extent, baseline disease activity, disease duration, and prior therapy) were generally consistent with the overall results. Treatment effects at week 48 in adolescents 12 to 17 years of age were consistent with the results observed in the overall study population.

In patients with actively progressing disease at baseline, disease stabilisation was assessed based on T-VASI. In both VITI-UP-1 and VITI-UP-2, a significantly greater proportion of patients treated with upadacitinib 15 mg compared to placebo had no increase in disease extent based on the achievement of no increase from baseline in T-VASI at both week 8 and 12 (Table 17).

Patient-reported outcomes

A significantly greater proportion of patients treated with upadacitinib 15 mg achieved a meaningful improvement in the Patient's Global Impression of Change Vitiligo (PaGIC-V, "Much better") and the Vitiligo Noticeability Scale (VNS, "A lot less noticeable" or "No longer noticeable").

Table 17 Efficacy results in patients with non-segmental vitiligo (VITI-UP-1 and VITI-UP-2)

Treatment Group	VITI-UP-1			VITI-UP-2		
	PBO N=102	UPA 15 mg N=206	Treatment Difference (95% CI)	PBO N=101	UPA 15 mg N=205	Treatment Difference (95% CI)
Co-primary Endpoints (Week 48)						
F-VASI 75	6%	25% ^e	19% (12, 26)	7%	23% ^e	17% (9, 24)
T-VASI 50	6%	19% ^e	13% (6, 20)	6%	21% ^e	15% (7, 22)
Week 48 Endpoints						
F-VASI 50	13%	48% ^e	34% (25, 43)	13%	43% ^e	30% (21, 39)
F-VASI 90	2%	16% ^e	13% (8, 18)	3%	12% ^f	9% (4, 15)
Percent change from Baseline in T-VASI, LSM (SE)	-9.1 (4.67)	-28.6 (4.03) ^e	-19.4 (-27.6, -11.2)	-12.5 (4.23)	-33.0 (3.20) ^e	-20.4 (-28.7, -12.1)
Physician's Global Impression of Change Vitiligo (PhGIC-V) score of 1 ^a	6%	20% ^e	13% (6, 19)	1%	17% ^e	15% (10, 21)
Early Onset Endpoints						
F-VASI 75 at Week 24	2%	15% ^e	13% (8, 18)	1%	11% ^e	11% (6, 15)
Percent change from Baseline in F-VASI at Week 24, LSM (SE)	-13.0 (5.09)	-42.4 (4.42) ^e	-29.4 (-38.1, -20.8)	-1.7 (4.46)	-27.9 (3.48) ^e	-26.2 (-34.4, -18.0)
Achievement of no increase from baseline in T-VASI at both Week 8 and Week 12 ^b	N=63 60%	N=141 76% ^g	16% (2, 30)	N=59 61%	N=119 76% ^g	15% (1, 29)
Patient-Reported Outcomes at Week 48						
PaGIC-V score of 1 ^c	4%	16% ^e	11% (5, 17)	1%	18% ^e	17% (11, 22)
VNS score of 4 or 5 ^d	2%	13% ^e	11%	1%	15% ^e	14%

			(5, 16)			(9, 19)
F-VASI 50/75/90 is $\geq 50\%$, $\geq 75\%$, or $\geq 90\%$ repigmentation of facial vitiligo from baseline. T-VASI 50 is $\geq 50\%$ repigmentation of total body vitiligo from baseline. LSM = Least Squares Mean; SE = Standard Error ^a PhGIC-V is a single-item questionnaire where the investigator rates the overall change in the patient's vitiligo by comparing the severity of vitiligo right now with the severity of vitiligo since the patient started the study treatment. Responses range from 1 = "Much better" to 5 = "Much worse". ^b Among patients with actively progressing vitiligo at baseline ^c The PaGIC-V is a single-item questionnaire that asks patients to rate the overall change in their vitiligo by comparing the severity of their vitiligo right now with the severity of their vitiligo since they started the study treatment. Responses range from 1 = "Much better" to 5 = "Much worse." ^d The VNS is a single-item questionnaire that assesses the noticeability of vitiligo lesions from the patient's perspective following therapy. The item is scored on a 5-point scale: 1 = more noticeable; 2 = as noticeable; 3 = slightly less noticeable; 4 = a lot less noticeable; and 5 = no longer noticeable. A score of 4 or 5 represents treatment success. ^e Multiplicity-controlled $p \leq 0.001$ upadacitinib vs placebo comparison ^f Multiplicity-controlled $p \leq 0.01$ upadacitinib vs placebo comparison ^g Multiplicity-controlled $p \leq 0.05$ upadacitinib vs placebo comparison						

Figure 3 shows the proportion of patients achieving F-VASI 75 and T-VASI 50 through week 48.

Figure 3 Proportion of patients achieving F-VASI 75 and T-VASI 50 through week 48 in VITI-UP-1 and VITI-UP-2 Combined

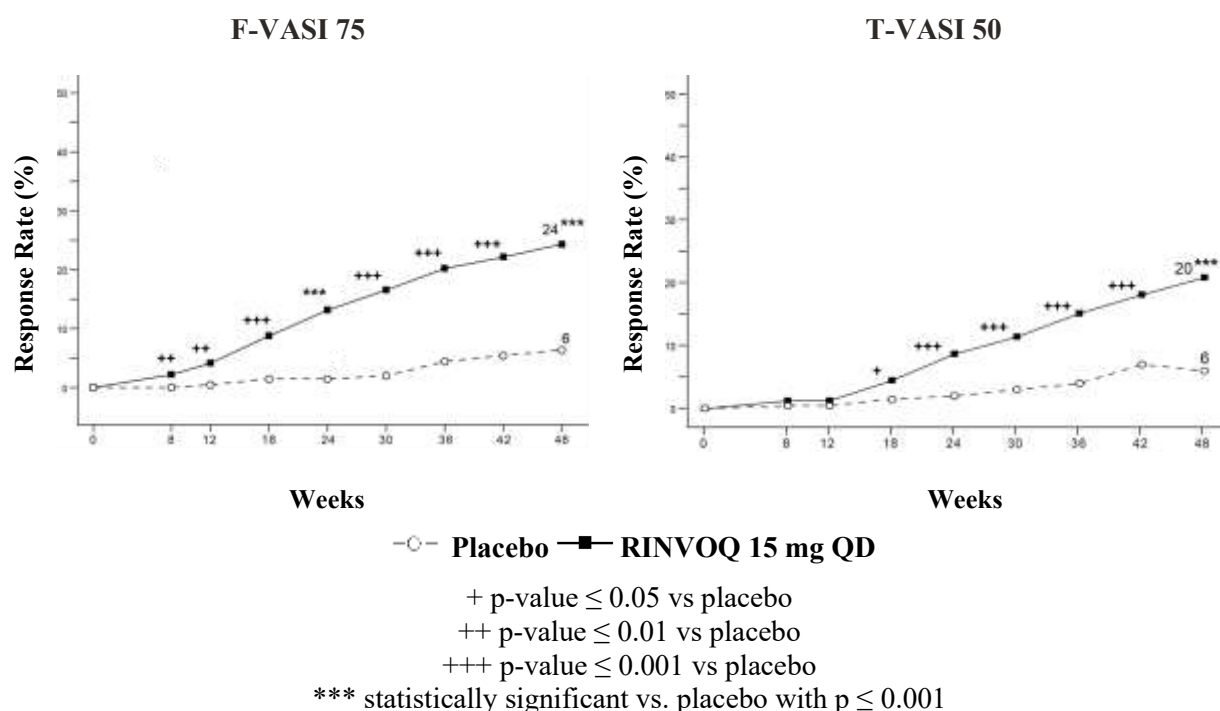
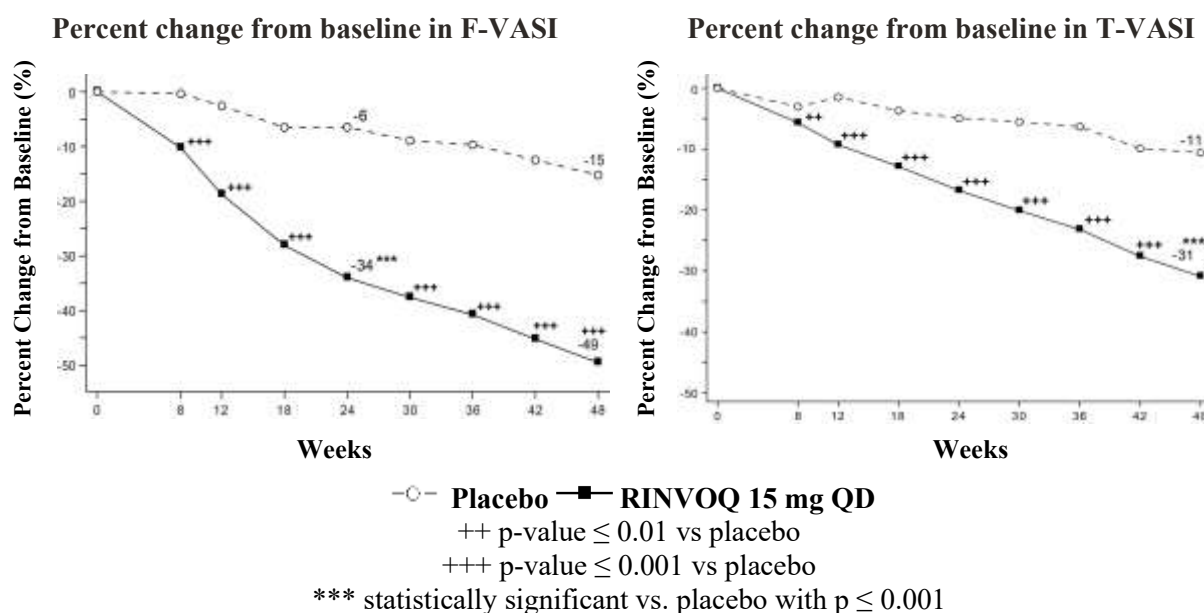


Figure 4 shows the percent change from baseline in F-VASI and T-VASI through week 48.

Figure 4 Percent change from baseline in F-VASI and T-VASI through week 48 in VITI-UP-1 and VITI-UP-2 Combined



Ulcerative colitis

The efficacy and safety of upadacitinib was evaluated in three multicentre, double-blind, placebo-controlled Phase 3 clinical studies: two replicate induction studies, UC-1 (U-ACHIEVE Induction) and UC-2 (U-ACCOMPLISH), and a maintenance study UC-3 (U-ACHIEVE Maintenance). In addition, safety and efficacy of upadacitinib were assessed in a long-term extension study, UC-4 (U-ACTIVATE).

Disease activity was based on the adapted Mayo score (aMS, Mayo scoring system excluding Physician's Global Assessment), which ranged from 0 to 9 and has three subscores that were each scored 0 (normal) to 3 (most severe): stool frequency subscore (SFS), rectal bleeding subscore (RBS) and a centrally-reviewed endoscopy subscore (ES).

Induction studies (UC-1 and UC-2)

In UC-1 and UC-2, 988 patients (473 and 515 patients, respectively) were randomised to upadacitinib 45 mg once daily or placebo for 8 weeks with a 2:1 treatment allocation ratio and included in the efficacy analysis. All enrolled patients had moderately to severely active ulcerative colitis defined as an aMS of 5 to 9 with an ES of 2 or 3 and demonstrated prior treatment failure including inadequate response, loss of response, or intolerance to prior conventional and/or biologic treatment. Prior treatment failure to at least 1 biologic therapy (prior biologic failure) was seen in 52% (246/473) and 51% (262/515) of patients, respectively. Previous treatment failure to conventional therapy but not biologics (without prior biologic failure) was seen in 48% (227/473) and 49% (253/515) of patients, respectively.

At baseline in UC-1 and UC-2, 39% and 37% of patients received corticosteroids, 1.1% and 0.6% of patients received methotrexate and 68% and 69% of patients received aminosaliclates. Concomitant use of thiopurine was not allowed during the studies. Patient disease activity was moderate (aMS ≥ 5 , ≤ 7) in 61% and 60% of patients and severe (aMS > 7) in 39% and 40% of patients.

The primary endpoint was clinical remission per aMS at week 8. Table 18 shows the primary and key secondary endpoints including clinical response, mucosal healing, histologic-endoscopic mucosal healing and deep mucosal healing.

Table 18 Proportion of patients meeting primary and key secondary efficacy endpoints at week 8 in the induction studies UC-1 and UC-2

Endpoint	UC-1 (U-ACHIEVE)			UC-2 (U-ACCOMPLISH)		
	PBO N=154	UPA 45 mg N=319	Treatment Difference (95% CI)	PBO N=174	UPA 45 mg N=341	Treatment Difference (95% CI)
Clinical remission^a	4.8%	26.1%	21.6%* (15.8, 27.4)	4.1%	33.5%	29.0%* (23.2, 34.7)
Prior biologic failure ⁺	0.4%	17.9%	17.5%	2.4%	29.6%	27.1%
Without prior biologic failure ⁺	9.2%	35.2%	26.0%	5.9%	37.5%	31.6%
Clinical response^b	27.3%	72.6%	46.3%* (38.4, 54.2)	25.4%	74.5%	49.4%* (41.7, 57.1)
Prior biologic failure ⁺	12.8%	64.4%	51.6%	19.3%	69.4%	50.1%
Without prior biologic failure ⁺	42.1%	81.8%	39.7%	31.8%	79.8%	48.0%
Mucosal healing^c	7.4%	36.3%	29.3%* (22.6, 35.9)	8.3%	44.0%	35.1%* (28.6, 41.6)
Prior biologic failure ⁺	1.7%	27.0%	25.3%	4.8%	37.1%	32.3%
Without prior biologic failure ⁺	13.2%	46.8%	33.6%	12.0%	51.2%	39.2%
Histologic-endoscopic mucosal healing^d	6.6%	30.1%	23.7%* (17.5, 30.0)	5.9%	36.7%	30.1%* (24.1, 36.2)
Prior biologic failure ⁺	1.4%	22.7%	21.3%	4.6%	30.7%	26.1%
Without prior biologic failure ⁺	11.8%	38.2%	26.4%	7.2%	42.9%	35.7%
Deep mucosal healing^e	1.3%	10.7%	9.7%* (5.7, 13.7)	1.7%	13.5%	11.3%* (7.2, 15.3)
Prior biologic failure ⁺	0	6.5%	6.5%	1.1%	9.2%	8.1%
Without prior biologic failure ⁺	2.6%	15.4%	12.8%	2.4%	17.9%	15.5%

Abbreviations: PBO = placebo; UPA= upadacitinib; aMS = adapted Mayo Score, based on the Mayo Scoring system (excluding Physician's Global Assessment), which ranged from 0 to 9 and has three subscores that were each scored 0 (normal) to 3 (most severe): stool frequency subscore (SFS), rectal bleeding subscore (RBS) and a centrally-reviewed endoscopy subscore (ES).

[†]The number of “Prior biologic failure” patients in UC-1 and UC-2 are 78 and 89 in the placebo group, and 168 and 173 in the upadacitinib 45 mg group, respectively; the number of “Without prior biologic failure” patients in UC-1 and UC-2 are 76 and 85 in the placebo group, and 151 and 168 in the upadacitinib 45 mg group, respectively.

^{*}p <0.001, adjusted treatment difference (95% CI)

^a Per aMS: SFS ≤ 1 and not greater than baseline, RBS = 0, ES ≤ 1 without friability

^b Per aMS: decrease ≥ 2 points and ≥ 30% from baseline and a decrease in RBS ≥ 1 from baseline or an absolute RBS ≤ 1.

^cES ≤ 1 without friability

^d ES ≤ 1 without friability and Geboes score ≤ 3.1 (indicating neutrophil infiltration in < 5% of crypts, no crypt destruction, and no erosions, ulcerations, or granulation tissue.)

^e ES = 0, Geboes score < 2 (indicating no neutrophil in crypts or lamina propria and no increase in eosinophil, no crypt destruction, and no erosions, ulcerations, or granulation tissue)

Disease activity and symptoms

The partial adapted Mayo score (paMS) is composed of SFS and RBS. Symptomatic response per paMS is defined as a decrease of ≥1 point and ≥30% from baseline and a decrease in RBS ≥ 1 or an absolute RBS ≤1. Statistically significant improvement compared to placebo per paMS was seen as early as week 2 (UC-1: 60.1% vs 27.3% and UC-2: 63.3% vs 25.9%).

Extended induction

A total of 125 patients in UC-1 and UC-2 who did not achieve clinical response after 8 weeks of treatment with upadacitinib 45 mg once daily entered an 8-week open-label extended induction period. After the treatment of an additional 8 weeks (16 weeks total) of upadacitinib 45 mg once daily, 48.3% of patients achieved clinical response per aMS. Among patients who responded to treatment of 16-week upadacitinib 45 mg once daily, 35.7% and 66.7% of patients maintained clinical response per aMS and 19.0% and 33.3% of patients achieved clinical remission per aMS at week 52 with maintenance treatment of upadacitinib 15 mg and 30 mg once daily, respectively.

Maintenance study (UC-3)

The efficacy analysis for UC-3 was evaluated in 451 patients who achieved clinical response per aMS with 8-week upadacitinib 45 mg once daily induction treatment. Patients were randomised to receive upadacitinib 15 mg, 30 mg or placebo once daily for up to 52 weeks.

The primary endpoint was clinical remission per aMS at week 52. Table 19 shows the key secondary endpoints including maintenance of clinical remission, corticosteroid-free clinical remission, mucosal healing, histologic-endoscopic mucosal healing and deep mucosal healing.

Table 19 Proportion of patients meeting primary and key secondary efficacy endpoints at week 52 in the maintenance study UC-3

	PBO N=149	UPA 15 mg N=148	UPA 30 mg N=154	Treatment Difference 15 mg vs PBO (95% CI)	Treatment Difference 30 mg vs PBO (95% CI)
Clinical remission^a	12.1%	42.3%	51.7%	30.7%* (21.7, 39.8)	39.0%* (29.7, 48.2)
Prior biologic failure ⁺	7.5%	40.5%	49.1%	33.0%	41.6%
Without prior biologic failure ⁺	17.6%	43.9%	54.0%	26.3%	36.3%
Maintenance of clinical remission^b	N = 54 22.2%	N = 47 59.2%	N = 58 69.7%	37.4%* (20.3, 54.6)	47.0%* (30.7, 63.3)
Prior biologic failure	N = 22 13.6%	N = 17 76.5%	N = 20 73.0%	62.8%	59.4%
Without prior biologic failure	N = 32 28.1%	N = 30 49.4%	N = 38 68.0%	21.3%	39.9%
Corticosteroid-free clinical remission^c	N = 54 22.2%	N = 47 57.1%	N = 58 68.0%	35.4%* (18.2, 52.7)	45.1%* (28.7, 61.6)
Prior biologic failure	N = 22 13.6%	N = 17 70.6%	N = 20 73.0%	57.0%	59.4%
Without prior biologic failure	N = 32 28.1%	N = 30 49.4%	N = 38 65.4%	21.3%	37.2%
Mucosal healing^d	14.5%	48.7%	61.6%	34.4%* (25.1, 43.7)	46.3%* (36.7, 55.8)
Prior biologic failure ⁺	7.8%	43.3%	56.1%	35.5%	48.3%
Without prior biologic failure ⁺	22.5%	53.6%	66.6%	31.1%	44.1%
Histologic-endoscopic mucosal healing^e	11.9%	35.0%	49.8%	23.8%* (14.8, 32.8)	37.3%* (27.8, 46.8)
Prior biologic failure ⁺	5.2%	32.9%	47.6%	27.7%	42.4%
Without prior biologic failure ⁺	20.0%	36.9%	51.8%	16.9%	31.8%
Deep mucosal healing^f	4.7%	17.6%	19.0%	13.0%* (6.0, 20.0)	13.6%* (6.6, 20.6)
Prior biologic failure ⁺	2.5%	17.2%	16.1%	14.7%	13.6%
Without prior biologic failure ⁺	7.5%	18.0%	21.6%	10.6%	14.2%

Abbreviations: PBO = placebo; UPA= upadacitinib; aMS = adapted Mayo Score, based on the Mayo Scoring system (excluding Physician's Global Assessment), which ranged from 0 to 9 and has three subscores that were each scored 0 (normal) to 3 (most severe): stool frequency subscore (SFS), rectal bleeding subscore (RBS) and a centrally-reviewed endoscopy subscore (ES).

⁺The number of “Prior biologic failure” patients are 81, 71, and 73 in the placebo, upadacitinib 15 mg, and 30 mg group, respectively. The number of “Without prior biologic failure” patients are 68, 77, and 81 in the placebo, upadacitinib 15 mg, and 30 mg group, respectively.

* p < 0.001, adjusted treatment difference (95% CI)

^a Per aMS: SFS ≤ 1 and not greater than baseline, RBS = 0, ES ≤ 1 without friability

^b Clinical remission per aMS at Week 52 among patients who achieved clinical remission at the end of induction treatment.

^c Clinical remission per aMS at Week 52 and corticosteroid-free for ≥90 days immediately preceding Week 52 among patients who achieved clinical remission at the end of the induction treatment.

^d ES ≤ 1 without friability

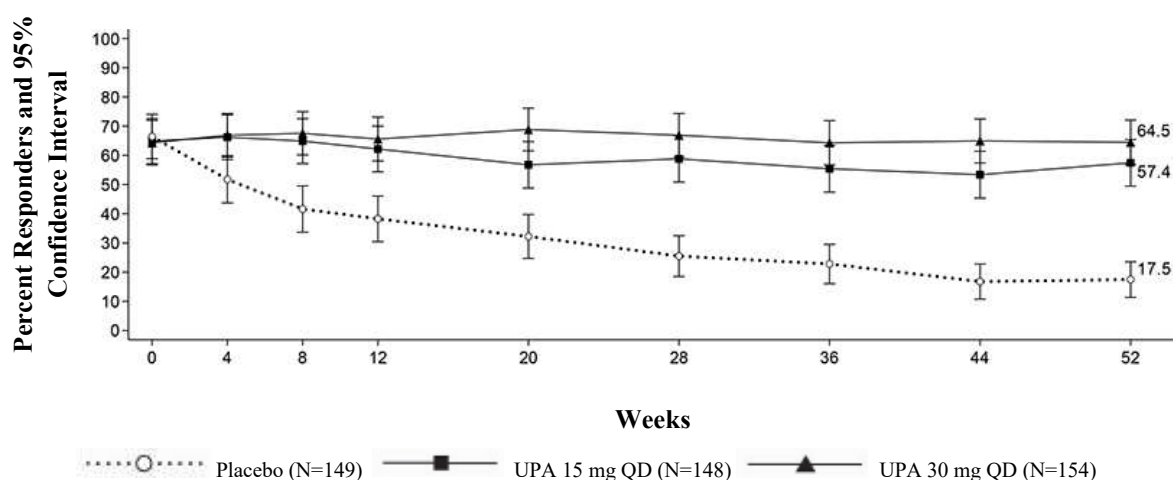
^e ES ≤ 1 without friability and Geboes score ≤ 3.1 (indicating neutrophil infiltration in <5% of crypts, no crypt destruction and no erosions, ulcerations or granulation tissue).

^f ES = 0, Geboes score < 2 (indicating no neutrophil in crypts or lamina propria and no increase in eosinophil, no crypt destruction, and no erosions, ulcerations or granulation tissue).

Disease symptoms

Symptomatic remission per paMS, defined as SFS ≤ 1 and RBS = 0, was achieved over time through week 52 in more patients treated with both upadacitinib 15 mg and 30 mg once daily compared with placebo (Figure 5).

Figure 5 Proportion of patients with symptomatic remission per partial adapted Mayo score over time in maintenance study UC-3



Endoscopic assessment

Endoscopic remission (normalisation of the endoscopic appearance of the mucosa) was defined as ES of 0. At week 8, a significantly greater proportion of patients treated with upadacitinib 45 mg once daily compared to placebo achieved endoscopic remission (UC-1: 13.7% vs 1.3%, UC-2: 18.2% vs 1.7%). In UC-3, a significantly greater proportion of patients treated with upadacitinib 15 mg and 30 mg once daily compared to placebo achieved endoscopic remission at week 52 (24.2% and 25.9% vs 5.6%). Maintenance of mucosal healing at week 52 (ES ≤ 1 without friability) was seen in a significantly greater proportion of patients treated with upadacitinib 15 mg and 30 mg once daily compared to placebo (61.6% and 69.5% vs 19.2%) among patients who achieved mucosal healing at the end of induction.

Quality of life

Patients treated with upadacitinib demonstrated significantly greater and clinically meaningful improvement in health-related quality of life measured by the Inflammatory Bowel Disease Questionnaire (IBDQ) total score compared to placebo. Improvements were seen in all 4 domain scores: systemic symptoms (including fatigue), social function, emotional function and bowel symptoms (including abdominal pain and bowel urgency). Changes in IBDQ total score at week 8 from baseline with upadacitinib 45 mg once daily compared to placebo were 55.3 and 21.7 in UC-1 and 52.2 and 21.1 in UC-2, respectively. Changes in IBDQ total score at week 52 from baseline were 49.2, 58.9 and 17.9 in patients treated with upadacitinib 15 mg, 30 mg once daily and placebo, respectively.

Long-term extension study (UC-4)

Patients who achieved clinical remission in UC-3 per aMS at 1 year were eligible to continue with the same dose in the extension study (UC-4). At the entry of UC-4, there were 96 and 146 patients in clinical remission and 49 and 82 patients in endoscopic remission with upadacitinib 15 mg and 30 mg,

respectively. This population is partly, but not fully, overlapping with the population presented in the above table depicting proportion of patients meeting endpoints at week 52 in the maintenance study UC-3. Among patients who achieved remission in UC-3 per aMS at 1 year and had available 96 weeks data, 55/70 (78.6%) and 75/89 (84.3%) maintained clinical remission and 22/34 (64.7%) and 40/54 (74.1%) maintained endoscopic remission after 96 weeks of additional treatment with upadacitinib 15 mg and 30 mg, respectively.

In patients entering the extension study upon completion of UC-3 (1 year) and had available 96 weeks data, improvements in IBDQ total scores and in IBDQ domain scores were maintained through week 96 of UC-4.

The safety profile of upadacitinib with long-term treatment was consistent with that in the placebo-controlled period.

Crohn's disease

The efficacy and safety of upadacitinib was evaluated in three multicenter, double-blind, placebo-controlled Phase 3 studies: two induction studies, CD-1 (U-EXCEED) and CD-2 (U-EXCEL), followed by a 52-week maintenance treatment and long-term extension study, CD-3 (U-ENDURE). The co-primary endpoints were clinical remission and endoscopic response at week 12 for CD-1 and CD-2, and at week 52 for CD-3.

Enrolled patients were 18 to 75 years of age with moderately to severely active Crohn's disease (CD), defined as an average daily very soft or liquid stool frequency (SF) ≥ 4 and/or average daily abdominal pain score (APS) ≥ 2 , and a centrally-reviewed Simple Endoscopic Score for CD (SES-CD) of ≥ 6 , or ≥ 4 for isolated ileal disease, excluding the narrowing component. Patients with symptomatic bowel strictures were excluded from CD studies.

Induction studies (CD-1 and CD-2)

In CD-1 and CD-2, 1021 patients (495 and 526 patients, respectively) were randomised to upadacitinib 45 mg once daily or placebo for 12 weeks with a 2:1 treatment allocation ratio.

In CD-1, all patients had inadequate response or were intolerant to treatment with one or more biologic therapies (prior biologic failure). Of these patients, 61% (301/495) had inadequate response or were intolerant to two or more biologic therapies.

In CD-2, 45% (239/526) patients had an inadequate response or were intolerant to treatment with one or more biologic therapies (prior biologic failure), and 55% (287/526) had an inadequate response or were intolerant to treatment with conventional therapies but not to biologic therapy (without prior biologic failure).

At baseline in CD-1 and CD-2, 34% and 36% of patients received corticosteroids, 7% and 3% of patients received immunomodulators, and 15% and 25% of patients received aminosalicylates.

In both studies, patients receiving corticosteroids at baseline initiated a corticosteroid taper regimen starting at week 4.

Both studies included a 12-week extended treatment period with upadacitinib 30 mg once daily for patients who received upadacitinib 45 mg once daily and did not achieve clinical response per SF/APS ($\geq 30\%$ decrease in average daily very soft or liquid SF and/or $\geq 30\%$ decrease in average daily APS and neither greater than baseline) at week 12.

Clinical disease activity and symptoms

In CD-1 and CD-2, a significantly greater proportion of patients treated with upadacitinib 45 mg achieved the co-primary endpoint of clinical remission at week 12 compared to placebo (Table 20). Onset of efficacy was rapid and achieved as early as week 2 (Table 20).

In both studies, patients receiving upadacitinib 45 mg experienced significantly greater improvement from baseline in fatigue, as measured by FACIT-F score at week 12 compared to placebo.

Endoscopic assessment

In CD-1 and CD-2, a significantly greater proportion of patients treated with upadacitinib 45 mg achieved the co-primary endpoint of endoscopic response at week 12 compared to placebo (Table 20). In CD-1 and CD-2, a greater proportion of patients treated with upadacitinib 45 mg (14% and 19%, respectively) compared to placebo (0% and 5%, respectively) achieved SES-CD 0-2.

Table 20 Proportion of patients meeting primary and additional efficacy endpoints in induction studies CD-1 and CD-2

Study	CD-1 (U-EXCEED)			CD-2 (U-EXCEL)		
Treatment Group	PBO N=171	UPA 45 mg N=324	Treatment Difference (95% CI)	PBO N=176	UPA 45 mg N=350	Treatment Difference (95% CI)
Co-Primary Endpoints at Week 12						
Clinical remission^a	14%	40%	26% (19, 33)*	22%	51%	29% (21, 36)*
Prior biologic failure				N=78 14%	N=161 47%	33% (22, 44)
Without prior biologic failure				N=98 29%	N=189 54%	26% (14, 37)
Endoscopic response^b	4%	35%	31% (25, 37)*	13%	46%	33% (26, 40)*
Prior biologic failure				N=78 9%	N=161 38%	29% (19, 39)
Without prior biologic failure				N=98 16%	N=189 52%	36% (25, 46)
Additional Endpoints at Week 12						
Clinical remission per CDAI^c	21%	39%	18% (10, 26)*	29%	49%	21% (13, 29)*
Clinical response (CR-100)^d	27%	51%	23% (14, 31)*	37%	57%	20% (11, 28)*
Corticosteroid-free clinical remission^{a,e}	N=60 7%	N=108 37%	30% (19, 41)*	N=64 13%	N=126 44%	33% (22, 44)*
Endoscopic remission^f	2%	19%	17% (12, 22)*	7%	29%	22% (16, 28)*
Mucosal healing^g	N=171 0%	N= 322 17%	17% (13, 21)***	N=174 5%	N=349 25%	20% (14, 25)***
Early Onset Endpoints						
Clinical remission at Week 4^a	9%	32%	23% (17, 30)*	15%	36%	21% (14, 28)*
CR-100 at Week 2^d	12%	33%	21% (14, 28)*	20%	32%	12% (4, 19)**
Abbreviation: PBO = placebo, UPA = upadacitinib						

* $p < 0.001$, adjusted treatment difference (95% CI)
 ** $p < 0.01$, adjusted treatment difference (95% CI)
 *** nominal $p < 0.001$ UPA vs PBO comparison, adjusted treatment difference (95% CI)
^a Average daily SF ≤ 2.8 and APS ≤ 1.0 and neither greater than baseline
^b Decrease in SES-CD $> 50\%$ from baseline of the induction study (or for patients with an SES-CD of 4 at baseline of the induction study, at least a 2-point reduction from baseline of the induction study)
^c CDAI < 150
^d Decrease of at least 100 points in CDAI from baseline
^e Discontinuation of steroid and achievement of clinical remission among patients on steroid at baseline
^f SES-CD ≤ 4 and at least a 2-point reduction versus baseline and no subscore > 1 in any individual variable
^g SES-CD ulcerated surface subscore of 0 in patients with SES-CD ulcerated surface subscore ≥ 1 at baseline

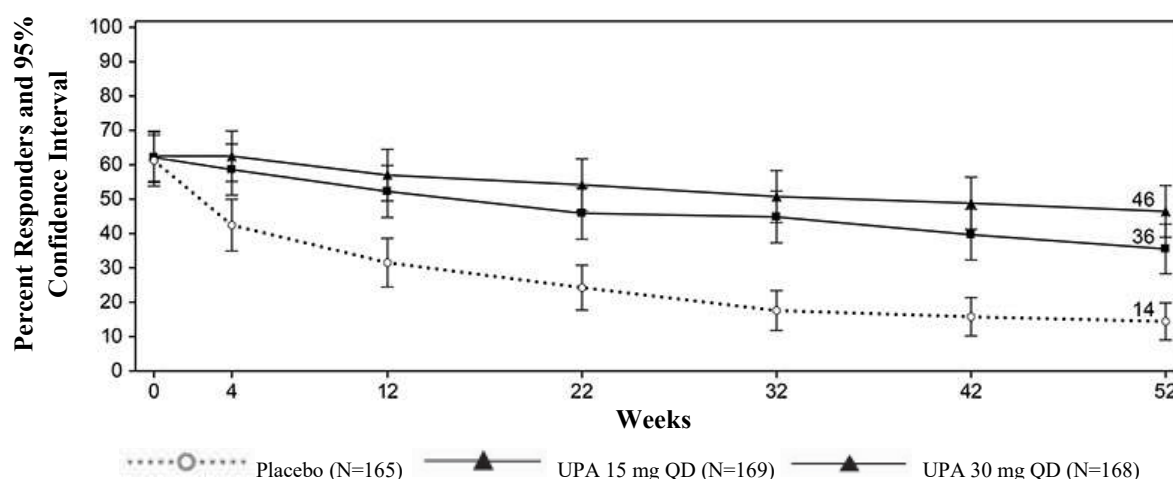
Maintenance study (CD-3)

The efficacy analysis for CD-3 evaluated 502 patients who achieved clinical response per SF/APS with the 12-week upadacitinib 45 mg once daily induction treatment. Patients were re-randomised to receive a maintenance regimen of either upadacitinib 15 mg or 30 mg once daily or placebo for 52 weeks.

Clinical disease activity and symptoms

A significantly greater proportion of patients treated with upadacitinib 15 mg and 30 mg achieved the co-primary endpoint of clinical remission at week 52 compared to placebo (Figure 6, Table 21).

Figure 6 Proportion of patients achieving clinical remission in maintenance study CD-3



Patients receiving upadacitinib 30 mg experienced significantly greater improvement from baseline in fatigue, as measured by FACIT-F score at week 52 compared to placebo.

Table 21 Proportion of patients meeting primary and additional efficacy endpoints at week 52 in maintenance study CD-3

Treatment Group	PBO ⁺ N=165	UPA 15 mg N=169	UPA 30 mg N=168	Treatment Difference 15 mg vs PBO (95% CI)	Treatment Difference 30 mg vs PBO (95% CI)
Co-Primary Endpoints					
Clinical remission^a	14%	36%	46%	22% (14, 30)*	32% (23, 40)*
Prior biologic failure	N=126 9%	N=124 32%	N=127 43%	24% (14, 33)	34% (24, 44)
Without prior biologic failure	N=39 33%	N=45 44%	N=41 59%	12% (-9, 33)	26% (5, 47)
Endoscopic response^b	7%	28%	40%	21% (14, 28)*	34% (26, 41)*
Prior biologic failure	N=126 4%	N=124 23%	N=127 39%	19% (11, 27)	35% (26, 44)
Without prior biologic failure	N=39 18%	N=45 40%	N=41 44%	22% (3, 41)	26% (7, 45)
Additional Endpoints					
Clinical remission per CDAI^c	15%	37%	48%	24% (15, 32)*	33% (24, 42)*
Clinical response (CR-100)^d	15%	41%	51%	27% (18, 36)*	36% (28, 45)*
Corticosteroid-free clinical remission^{a,e}	14%	35%	45%	21% (13, 30)*	30% (21, 39)*
Maintenance of clinical remission^{a,f}	N=101 20%	N=105 50%	N=105 60%	32% (20, 44)*	40% (28, 52)*
Endoscopic remission^g	5%	19%	29%	14% (8, 21)*	24% (16, 31)*
Mucosal healing^h	N=164 4%	N=167 13%	N=168 24%	10% (4, 16)***	21% (14, 27)***
Deep remission^{a,i}	4%	14%	23%	10% (4, 16)**	18% (11, 25)*

Abbreviation: PBO = placebo, UPA = upadacitinib

⁺ The placebo group consisted of patients who achieved clinical response per SF/APS with upadacitinib 45 mg at the end of the induction study and were randomised to receive placebo at the start of maintenance therapy

* $p < 0.001$, adjusted treatment difference (95% CI)

** $p < 0.01$, adjusted treatment difference (95% CI)

*** nominal $p < 0.001$ UPA vs PBO comparison, adjusted treatment difference (95% CI)

^a Average daily SF ≤ 2.8 and APS ≤ 1.0 and neither greater than baseline

^b Decrease in SES-CD $> 50\%$ from baseline of the induction study (or for patients with an SES-CD of 4 at baseline of the induction study, at least a 2-point reduction from baseline of the induction study)

^c CDAI < 150

^d Reduction of CDAI ≥ 100 points from baseline

^e Corticosteroid-free for 90 days prior to week 52 and achievement of clinical remission. Among the subset of patients who were on corticosteroids at induction baseline, 38% (N=63) in upadacitinib

15 mg group, 38% (N=63) in upadacitinib 30 mg group, and 5% (N=61) in placebo were corticosteroid-free for 90 days prior to week 52 and in clinical remission

^f Defined as achievement of clinical remission at Week 52 in patients who achieved clinical remission at the entry of the maintenance study

^g SES-CD ≤ 4 and at least a 2-point reduction versus baseline and no subscore >1 in any individual variable

^h SES-CD ulcerated surface subscore of 0 in patients with SES-CD ulcerated surface subscore ≥ 1 at baseline

ⁱ Clinical remission and endoscopic remission

Patients who were not in clinical response per SF/APS to upadacitinib induction at week 12 in CD-1 and CD-2 (122 patients) received upadacitinib 30 mg once daily for an additional 12 weeks. Of these patients, 53% achieved clinical response at week 24. Of the patients who responded to the extended treatment period and continued to receive maintenance treatment with upadacitinib 30 mg, 25% achieved clinical remission and 22% achieved endoscopic response at week 52.

Endoscopic assessment

In CD-3, a significantly greater proportion of patients treated with upadacitinib 15 mg and 30 mg achieved the co-primary endpoint of endoscopic response at week 52 compared to placebo (Table 21). In addition to the endoscopic endpoints described in Table 21, a greater proportion of patients treated with upadacitinib 15 mg and 30 mg (11% and 21%, respectively) compared to placebo (3%) achieved SES-CD 0-2 at week 52. Corticosteroid-free endoscopic remission among patients on steroid at baseline was achieved in a greater proportion of patients treated with upadacitinib 15 mg and 30 mg (17% and 25%, respectively) compared to placebo (3%) at week 52.

Resolution of extra-intestinal manifestations

Resolution of extra-intestinal manifestations was observed in a greater proportion of patients treated with upadacitinib 15 mg (25%) and a significantly greater proportion of patients treated with upadacitinib 30 mg (36%) compared to placebo (15%) at week 52.

Rescue treatment

In CD-3, patients who demonstrated inadequate response or lost response during maintenance were eligible to receive rescue treatment with upadacitinib 30 mg. Of the patients who were randomised to upadacitinib 15 mg group and received rescue treatment of upadacitinib 30 mg for at least 12 weeks, 84% (76/90) achieved clinical response per SF/APS and 48% (43/90) achieved clinical remission 12 weeks after initiating rescue.

Health-related quality of life outcomes

Patients treated with upadacitinib achieved greater improvement in health-related quality of life (HRQOL) measured by the Inflammatory Bowel Disease Questionnaire (IBDQ) total score compared to placebo. Improvements were seen in all 4 domain scores: systemic symptoms (including fatigue) and bowel symptoms (including abdominal pain and bowel urgency), as well as social and emotional functioning. Changes from baseline in IBDQ total score at week 12 with upadacitinib 45 mg once daily compared to placebo were 46.0 and 21.6 in CD-1 and 46.3 and 24.4 in CD-2, respectively. Changes in IBDQ total score at week 52 from baseline were 59.3, 64.5 and 46.4 in patients treated with upadacitinib 15 mg, 30 mg once daily and placebo, respectively.

Paediatric population

Atopic dermatitis

A total of 542 adolescents aged 12 to 17 years with moderate to severe atopic dermatitis were randomised across the three global Phase 3 studies, of which 344 were evaluated for the primary

analysis. Adolescents in the primary analysis were randomised to receive either 15 mg (N=114) or 30 mg (N=114) upadacitinib or matching placebo (N=116), in monotherapy or combination with topical corticosteroids. Efficacy was consistent between the adolescents and adults. Efficacy results at week 16 were maintained through week 260 in adolescents treated with upadacitinib 15 mg or 30 mg (at week 260, N=273 in the study; N=261 with efficacy data).

The safety profile in adolescents was generally similar to that in adults, with dose-dependent increases in the rate of some adverse events, including neutropenia and herpes zoster. At both doses, the rate of neutropenia was slightly increased in adolescents compared to adults. At both doses, the rate of herpes zoster was higher in adults compared to that in adolescents.

Table 22 Efficacy results of upadacitinib for adolescents at week 16

Study	MEASURE UP 1			MEASURE UP 2			AD UP		
Treatment Group	PBO	UPA 15 mg	UPA 30 mg	PBO	UPA 15 mg	UPA 30 mg	PBO + TCS	UPA 15 mg + TCS	UPA 30 mg + TCS
Number of adolescent subjects randomised	40	42	42	36	33	35	40	39	37
% responders (95% CI)									
vIGA-AD 0/1 ^{a,b}	8 (0,16)	38 (23,53)	69 (55,83)	3 (0,8)	42 (26,59)	62 (46,79)	8 (0,16)	31 (16,45)	65 (50,80)
EASI 75 ^a	8 (0,17)	71 (58,85)	83 (72,95)	14 (3,25)	67 (51,83)	74 (59,90)	30 (16,44)	56 (41,72)	76 (62,90)
Worst Pruritus NRS ^c (≥ 4 -point improvement)	15 (4,27)	45 (30,60)	55 (40,70)	3 (0,8)	33 (16,50)	50 (33,67)	13 (2,24)	42 (26,58)	55 (38,72)
Abbreviations: UPA= upadacitinib (RINVOQ); PBO = placebo Subjects with rescue medication or with missing data were counted as non-responders. ^a Based on number of subjects randomised ^b Responder was defined as a patient with vIGA-AD 0 or 1 (“clear” or “almost clear”) with a reduction of ≥ 2 points on a 0-4 ordinal scale. ^c Results shown in subset of patients eligible for assessment (patients with Worst Pruritus NRS ≥ 4 at baseline).									

The European Medicines Agency has deferred the obligation to submit the results of studies with RINVOQ in one or more subsets of the paediatric population in chronic idiopathic arthritis (including rheumatoid arthritis, psoriatic arthritis, spondyloarthritis and juvenile idiopathic arthritis) atopic dermatitis, alopecia areata, vitiligo, ulcerative colitis, and Crohn’s disease (see section 4.2 for information on paediatric use).

5.2 Pharmacokinetic properties

Upadacitinib plasma exposures are proportional to dose over the therapeutic dose range. Steady-state plasma concentrations are achieved within 4 days with minimal accumulation after multiple once daily administrations.

Absorption

Following oral administration of upadacitinib prolonged-release formulation, upadacitinib is absorbed with a median T_{max} of 2 to 4 hours. Coadministration of upadacitinib with a high-fat meal had no clinically relevant effect on upadacitinib exposures (increased AUC by 29% and C_{max} by 39% to 60%).

In clinical trials, upadacitinib was administered without regard to meals (see section 4.2). *In vitro*, upadacitinib is a substrate for the efflux transporters P-gp and BCRP.

Distribution

Upadacitinib is 52% bound to plasma proteins. Upadacitinib partitions similarly between plasma and blood cellular components, as indicated by the blood to plasma ratio of 1.0.

Metabolism

Upadacitinib metabolism is mediated by CYP3A4 with a potential minor contribution from CYP2D6. The pharmacologic activity of upadacitinib is attributed to the parent molecule. In a human radiolabeled study, unchanged upadacitinib accounted for 79% of the total radioactivity in plasma while the main metabolite (product of monooxidation followed by glucuronidation) accounted for 13% of the total plasma radioactivity. No active metabolites have been identified for upadacitinib.

Elimination

Following single dose administration of [¹⁴C]-upadacitinib immediate-release solution, upadacitinib was eliminated predominantly as the unchanged parent substance in urine (24%) and faeces (38%). Approximately 34% of upadacitinib dose was excreted as metabolites. Upadacitinib mean terminal elimination half-life ranged from 9 to 14 hours.

Special populations

Renal impairment

Upadacitinib AUC was 18%, 33%, and 44% higher in subjects with mild (estimated glomerular filtration rate 60 to 89 ml/min/1.73 m²), moderate (estimated glomerular filtration rate 30 to 59 ml/min/1.73 m²), and severe (estimated glomerular filtration rate 15 to 29 ml/min/1.73 m²) renal impairment, respectively, compared to subjects with normal renal function. Upadacitinib C_{max} was similar in subjects with normal and impaired renal function. Mild or moderate renal impairment has no clinically relevant effect on upadacitinib exposure (see section 4.2).

Hepatic impairment

Mild (Child-Pugh A) and moderate (Child-Pugh B) hepatic impairment has no clinically relevant effect on upadacitinib exposure. Upadacitinib AUC was 28% and 24% higher in subjects with mild and moderate hepatic impairment, respectively, compared to subjects with normal liver function. Upadacitinib C_{max} was unchanged in subjects with mild hepatic impairment and 43% higher in subjects with moderate hepatic impairment compared to subjects with normal liver function. Upadacitinib was not studied in patients with severe (Child-Pugh C) hepatic impairment.

Paediatric population

The pharmacokinetics of upadacitinib have not yet been evaluated in paediatric patients with rheumatoid arthritis, psoriatic arthritis, axial spondyloarthritis, ulcerative colitis, and Crohn's disease (see section 4.2).

Upadacitinib pharmacokinetics and steady-state concentrations are similar for adults and adolescents 12 to 17 years of age with atopic dermatitis, alopecia areata and vitiligo.

The posology in adolescent patients 30 kg to < 40 kg with atopic dermatitis was determined using population pharmacokinetic modelling and simulation. No clinical exposure data are available in adolescents < 40 kg with atopic dermatitis.

The pharmacokinetics of upadacitinib in paediatric patients (< 12 years of age) with atopic dermatitis, alopecia areata or vitiligo have not been established.

Intrinsic factors

Age, sex, body weight, race, and ethnicity did not have a clinically meaningful effect on upadacitinib exposure. Upadacitinib pharmacokinetics are consistent between rheumatoid arthritis, psoriatic arthritis, axial spondyloarthritis, giant cell arteritis, atopic dermatitis, alopecia areata, vitiligo, ulcerative colitis, and Crohn's disease patients.

5.3 Preclinical safety data

Non-clinical data reveal no special hazard for humans based on conventional studies of safety pharmacology.

Upadacitinib, at exposures (based on AUC) approximately 4 and 10 times the clinical dose of 15 mg, 2 and 5 times the clinical dose of 30 mg, and 1.7 and 4 times the clinical dose of 45 mg in male and female Sprague-Dawley rats, respectively, was not carcinogenic in a 2-year carcinogenicity study in Sprague-Dawley rats. Upadacitinib was not carcinogenic in a 26-week carcinogenicity study in CByB6F1-Tg(HRAS)2Jic transgenic mice.

Upadacitinib was not mutagenic or genotoxic based on the results of *in vitro* and *in vivo* tests for gene mutations and chromosomal aberrations.

Upadacitinib had no effect on fertility in male or female rats at exposures up to approximately 17 and 34 times the maximum recommended human dose (MRHD) of 45 mg in males and females, respectively, on an AUC basis in a fertility and early embryonic development study. Dose-related increases in foetal resorptions associated with post-implantation losses in this fertility study in rats were attributed to the developmental/teratogenic effects of upadacitinib. No adverse effects were observed at exposures below clinical exposure (based on AUC). Post-implantation losses were observed at exposures 9 times the clinical exposure at the MRHD of 45 mg (based on AUC).

In animal embryo-foetal development studies, upadacitinib was teratogenic in both rats and rabbits. Upadacitinib resulted in increases in skeletal malformations in rats at 1.6, 0.8, and 0.6 times the clinical exposure (AUC-based) at the 15, 30, and 45 mg (MRHD) doses, respectively. In rabbits an increased incidence of cardiovascular malformations was observed at 15, 7.6, and 6 times the clinical exposure at the 15, 30, and 45 mg doses (AUC-based), respectively.

Following administration of upadacitinib to lactating rats, the concentrations of upadacitinib in milk over time generally paralleled those in plasma, with approximately 30-fold higher exposure in milk relative to maternal plasma. Approximately 97% of upadacitinib-related material in milk was the parent molecule, upadacitinib.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet contents

Microcrystalline cellulose
Hypromellose
Mannitol
Tartaric acid
Silica, colloidal anhydrous
Magnesium stearate

Film coating

Poly(vinyl alcohol)

Macrogol

Talc

Titanium dioxide (E171)

Iron oxide black (E172) (15 mg strength only)

Iron oxide red (E172)

Iron oxide yellow (E172) (45 mg strength only)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

RINVOQ 15 mg prolonged-release tablets

Prolonged-release tablets in blisters: 2 years

Prolonged-release tablets in bottles: 3 years

RINVOQ 30 mg prolonged-release tablets

Prolonged-release tablets in blisters: 2 years

Prolonged-release tablets in bottles: 3 years

RINVOQ 45 mg prolonged-release tablets

Prolonged-release tablets in blisters: 2 years

Prolonged-release tablets in bottles: 3 years

6.4 Special precautions for storage

This medicinal product does not require any special temperature storage conditions.

Store in the original blister or bottle in order to protect from moisture. Keep the bottle tightly closed.

6.5 Nature and contents of container

RINVOQ 15 mg prolonged-release tablets

Polyvinylchloride/polyethylene/polychlorotrifluoroethylene - aluminium calendar blisters in packs containing 28 or 98 prolonged-release tablets, or multipacks containing 84 (3 packs of 28) prolonged-release tablets.

HDPE bottles with desiccant and polypropylene cap in carton containing 30 prolonged-release tablets. Pack size: 1 bottle (30 prolonged-release tablets) or 3 bottles (90 prolonged-release tablets).

Not all pack sizes may be marketed.

RINVOQ 30 mg prolonged-release tablets

Polyvinylchloride/polyethylene/polychlorotrifluoroethylene - aluminium calendar blisters in packs containing 28 or 98 prolonged-release tablets.

HDPE bottles with desiccant and polypropylene cap in carton containing 30 prolonged-release tablets.

Pack size: 1 bottle (30 prolonged-release tablets) or 3 bottles (90 prolonged-release tablets).

Not all pack sizes may be marketed.

RINVOQ 45 mg prolonged-release tablets

Polyvinylchloride/polyethylene/polychlorotrifluoroethylene - aluminium calendar blisters in packs containing 28 prolonged-release tablets.

HDPE bottles with desiccant and polypropylene cap in carton containing 28 prolonged-release tablets.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

7. MARKETING AUTHORISATION HOLDER

AbbVie Deutschland GmbH & Co. KG
Knollstrasse
67061 Ludwigshafen
Germany

8. MARKETING AUTHORISATION NUMBER(S)

EU/1/19/1404/001
EU/1/19/1404/002
EU/1/19/1404/003
EU/1/19/1404/004
EU/1/19/1404/005
EU/1/19/1404/006
EU/1/19/1404/007
EU/1/19/1404/008
EU/1/19/1404/009
EU/1/19/1404/010
EU/1/19/1404/011

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 16 December 2019

Date of latest renewal: 19 September 2024

10. DATE OF REVISION OF THE TEXT

09/2026

Detailed information on this medicinal product is available on the website of the European Medicines Agency <https://www.ema.europa.eu>.