



## Clinical trial results:

### A Phase 2b, Randomized, Double-Blind, Parallel-Group, Placebo-Controlled, Dose-Finding, Multi-Center Study to Evaluate the Safety and Efficacy of ASP015K in Moderate to Severe Rheumatoid Arthritis Subjects

#### Summary

EudraCT number	2011-006020-20
Trial protocol	HU CZ PL BG
Global end of trial date	02 December 2013

#### Results information

Result version number	v1
This version publication date	04 May 2016
First version publication date	02 July 2015

#### Trial information

##### Trial identification

Sponsor protocol code	015K-CL-RA22
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##### Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01565655
WHO universal trial number (UTN)	-

Notes:

#### Sponsors

Sponsor organisation name	Astellas Pharma Global Development, Inc. (APGD)
Sponsor organisation address	1 Astellas Way, Northbrook, IL, United States, 60062
Public contact	Clinical Trial Disclosure, Astellas Pharma Global Development, Inc. (APGD), Astellas.resultsdisclosure@astellas.com
Scientific contact	Clinical Trial Disclosure, Astellas Pharma Global Development, Inc. (APGD), Astellas.resultsdisclosure@astellas.com

Notes:

#### Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

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## Results analysis stage

Analysis stage	Final
Date of interim/final analysis	02 December 2013
Is this the analysis of the primary completion data?	Yes
Primary completion date	02 December 2013
Global end of trial reached?	Yes
Global end of trial date	02 December 2013
Was the trial ended prematurely?	No

Notes:

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## General information about the trial

Main objective of the trial:

The objective of this study is to evaluate the safety and efficacy of ASP015K in moderate to severe Rheumatoid Arthritis (RA) subjects.

Protection of trial subjects:

This clinical study was written, conducted and reported in accordance with the protocol, ICH GCP Guidelines, and applicable local regulations, including the European Directive 2001/20/EC, on the protection of human rights, and with the ethical principles that have their origin in the Declaration of Helsinki. Astellas ensures that the use and disclosure of protected health information (PHI) obtained during a research study complies with the federal, national and/or regional legislation related to the privacy and protection of personal information.

Background therapy:

This study was comprised of up to a 4-week screening period, a 12-week treatment period and a 30-day follow-up period. Once informed consent was obtained, the disease-modifying antirheumatic drug (DMARD) washout period (as applicable) could begin prior to screening. During screening (day -28 to day -1), entry criteria were confirmed and screening procedures were performed. Randomization occurred on day 1 and study drug was administered for 12 weeks (day 1 to day 84). At the end of treatment (EOT), end of study (EOS) procedures and a follow-up assessment of adverse events (AEs) were conducted for up to 30 days (day 85 to day 115).

DMARD Washout Period: Period of time during which patients do not receive specific DMARD medications, and the effects of the DMARD medication are eliminated (or assumed to be eliminated). The DMARD washout period in this trial begins 1 to 26 weeks prior to start of study drug (duration is based on the disease-modifying antirheumatic drug used).

Evidence for comparator:

Placebo was used as comparative drug. ASP015K matching placebo tablets contain the same ingredients as the test drug except for active drug substance and hydroxy-propyl cellulose.

Actual start date of recruitment	19 June 2012
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	Yes

Notes:

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## Population of trial subjects

### Subjects enrolled per country

Country: Number of subjects enrolled	Poland: 57
Country: Number of subjects enrolled	Bulgaria: 12
Country: Number of subjects enrolled	Czech Republic: 25
Country: Number of subjects enrolled	Hungary: 25
Country: Number of subjects enrolled	Mexico: 32
Country: Number of subjects enrolled	United States: 138

Worldwide total number of subjects	289
EEA total number of subjects	119

Notes:

<b>Subjects enrolled per age group</b>	
In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	249
From 65 to 84 years	40
85 years and over	0

## Subject disposition

### Recruitment

Recruitment details:

This multi-center study was conducted at 41 sites, 19 sites in the US, 3 sites in Bulgaria, 4 sites in the Czech Republic, 5 sites in Hungary, 6 sites in Poland and 4 sites in Mexico. The Principal Investigator at each site was a licensed clinician with experience in the therapeutic area of rheumatoid arthritis (RA).

### Pre-assignment

Screening details:

The study was comprised of a screening period of up to 4 weeks (28 days), a treatment period of 12 weeks and a follow-up period of 30 days.

### Period 1

Period 1 title	Overall period (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator, Monitor, Data analyst, Carer, Assessor

Blinding implementation details:

This was a double-blind study. The investigator, patient, clinical staff and Sponsor's study management team were blinded to treatment assignments.

### Arms

Are arms mutually exclusive?	Yes
<b>Arm title</b>	Placebo

Arm description:

This arm consisted of matching ASP015K placebo taken orally with food, for 12 weeks (days 1-84) after randomization.

Arm type	Placebo
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Film-coated tablet
Routes of administration	Oral use

Dosage and administration details:

ASP015K matching placebo tablets contained the same ingredients as the test drug except for active drug substance and hydroxy-propyl cellulose. Placebo was to be taken orally with food, daily for 12 weeks (days 1-84) after randomization. The first dose was taken on Baseline/Day 1 of the treatment period at the site.

<b>Arm title</b>	ASP015K 25 mg once daily
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Arm description:

This arm consisted of ASP015K 25 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.

Arm type	Experimental
Investigational medicinal product name	ASP015K
Investigational medicinal product code	ASP015K
Other name	Peficitinib (USAN)
Pharmaceutical forms	Film-coated tablet
Routes of administration	Oral use

Dosage and administration details:

The test drug for this study is ASP015K. ASP015K is a round, yellow, film-coated tablet. ASP015K 25 mg once daily was to be taken orally with food, daily for 12 weeks (days 1-84) after randomization.

<b>Arm title</b>	ASP015K 50 mg once daily
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**Arm description:**

This arm consisted of ASP015K 50 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.

Arm type	Experimental
Investigational medicinal product name	ASP015K
Investigational medicinal product code	ASP015K
Other name	Peficitinib (USAN)
Pharmaceutical forms	Film-coated tablet
Routes of administration	Oral use

**Dosage and administration details:**

The test drug for this study is ASP015K. ASP015K is a round, yellow, film-coated tablet. ASP015K 50 mg once daily was to be taken orally with food, daily for 12 weeks (days 1-84) after randomization.

<b>Arm title</b>	ASP015K 100 mg once daily
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**Arm description:**

This arm consisted of ASP015K 100 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.

Arm type	Experimental
Investigational medicinal product name	ASP015K
Investigational medicinal product code	ASP015K
Other name	Peficitinib (USAN)
Pharmaceutical forms	Film-coated tablet
Routes of administration	Oral use

**Dosage and administration details:**

The test drug for this study is ASP015K. ASP015K is a round, yellow, film-coated tablet. ASP015K 100 mg once daily was to be taken orally with food, daily for 12 weeks (days 1-84) after randomization.

<b>Arm title</b>	ASP015K 150 mg once daily
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**Arm description:**

This arm consisted of ASP015K 150 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.

Arm type	Experimental
Investigational medicinal product name	ASP015K
Investigational medicinal product code	ASP015K
Other name	Peficitinib (USAN)
Pharmaceutical forms	Film-coated tablet
Routes of administration	Oral use

**Dosage and administration details:**

The test drug for this study is ASP015K. ASP015K is a round, yellow, film-coated tablet. ASP015K 150 mg once daily was to be taken orally with food, daily for 12 weeks (days 1-84) after randomization.

<b>Number of subjects in period 1</b>	Placebo	ASP015K 25 mg once daily	ASP015K 50 mg once daily
Started	51	59	57
Completed	49	50	49
Not completed	2	9	8
Protocol violation	-	1	1
Adverse event	1	4	2
Patient non-compliant	-	-	1
Withdrawal by subject	1	1	3

Lack of efficacy	-	1	1
Treatment interrupted due to adverse event	-	1	-
Treatment interrupted due to antibiotic use	-	1	-

<b>Number of subjects in period 1</b>	ASP015K 100 mg once daily	ASP015K 150 mg once daily
Started	58	64
Completed	54	60
Not completed	4	4
Protocol violation	1	-
Adverse event	1	2
Patient non-compliant	-	-
Withdrawal by subject	2	1
Lack of efficacy	-	1
Treatment interrupted due to adverse event	-	-
Treatment interrupted due to antibiotic use	-	-

## Baseline characteristics

### Reporting groups

Reporting group title	Placebo
Reporting group description: This arm consisted of matching ASP015K placebo taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 25 mg once daily
Reporting group description: This arm consisted of ASP015K 25 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 50 mg once daily
Reporting group description: This arm consisted of ASP015K 50 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 100 mg once daily
Reporting group description: This arm consisted of ASP015K 100 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 150 mg once daily
Reporting group description: This arm consisted of ASP015K 150 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	

Reporting group values	Placebo	ASP015K 25 mg once daily	ASP015K 50 mg once daily
Number of subjects	51	59	57
Age categorical			
Units: Subjects			
In utero			
Preterm newborn infants (gestational age < 37 wks)			
Newborns (0-27 days)			
Infants and toddlers (28 days-23 months)			
Children (2-11 years)			
Adolescents (12-17 years)			
Adults (18-64 years)			
From 65-84 years			
85 years and over			
Age continuous			
Age values were based on the Safety Analysis Set (SAF) population. The SAF was defined as all patients who received at least 1 dose of study drug.			
Units: years			
arithmetic mean	52.7	52.6	54.8
standard deviation	± 12.2	± 10.2	± 10
Gender categorical			
Gender values are based on the SAF population.			
Units: Subjects			
Female	42	46	48
Male	9	13	9

<b>Reporting group values</b>	ASP015K 100 mg once daily	ASP015K 150 mg once daily	Total
Number of subjects	58	64	289
Age categorical			
Units: Subjects			
In utero			0
Preterm newborn infants (gestational age < 37 wks)			0
Newborns (0-27 days)			0
Infants and toddlers (28 days-23 months)			0
Children (2-11 years)			0
Adolescents (12-17 years)			0
Adults (18-64 years)			0
From 65-84 years			0
85 years and over			0
Age continuous			
Age values were based on the Safety Analysis Set (SAF) population. The SAF was defined as all patients who received at least 1 dose of study drug.			
Units: years			
arithmetic mean	54.9	54.4	
standard deviation	± 11.3	± 12.5	-
Gender categorical			
Gender values are based on the SAF population.			
Units: Subjects			
Female	51	50	237
Male	7	14	52



## End points

### End points reporting groups

Reporting group title	Placebo
Reporting group description: This arm consisted of matching ASP015K placebo taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 25 mg once daily
Reporting group description: This arm consisted of ASP015K 25 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 50 mg once daily
Reporting group description: This arm consisted of ASP015K 50 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 100 mg once daily
Reporting group description: This arm consisted of ASP015K 100 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Reporting group title	ASP015K 150 mg once daily
Reporting group description: This arm consisted of ASP015K 150 mg once a daily taken orally with food, for 12 weeks (days 1-84) after randomization.	
Subject analysis set title	H1 Metabolite - ASP015K 25 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the Pharmacokinetic Analysis Set (PKAS). The PKAS consisted of all patients who received at least 1 dose of study drug and who had values of drug concentration for at least 1 time point. The PKAS population included all of the patients treated with ASP015K that were also included in the Full Analysis Set (FAS - all randomized subjects that received at least one study drug dose) and Safety Analysis Set (SAF-all patients who received at least 1 dose of study drug).	
Subject analysis set title	H1 Metabolite - ASP015K 50 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H1 Metabolite - ASP015K 100 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H1 Metabolite - ASP015K 150 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H2 Metabolite - ASP015K 25 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H2 Metabolite - ASP015K 50 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS. )	
Subject analysis set title	H2 Metabolite - ASP015K 100 mg (PKAS)

Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H2 Metabolite - ASP015K 150 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H4 Metabolite - ASP015K 25 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H4 Metabolite - ASP015K 50 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H4 Metabolite - ASP015K 100 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	
Subject analysis set title	H4 Metabolite - ASP015K 150 mg (PKAS)
Subject analysis set type	Full analysis
Subject analysis set description: The study analysis population consisted of the PKAS.	

**Primary: Percentage of participants achieving a response in American College of Rheumatology (ACR) criteria for 20% improvement in disease severity (ACR 20) using the C-reactive protein (CRP) level (ACR20-CRP) at week 12**

End point title	Percentage of participants achieving a response in American College of Rheumatology (ACR) criteria for 20% improvement in disease severity (ACR 20) using the C-reactive protein (CRP) level (ACR20-CRP) at week 12
End point description: The study analysis population consisted of the Full Analysis Set (FAS), defined as all randomized subjects that received at least one study drug dose. ACR20-CRP responder determined at week 12 if ACR response criteria was met: At least 20% reduction from baseline at week 12 TJC68 count, At least 20% reduction from baseline at week 12 SJC66 count, At least 20% reduction from baseline at week 12 in any 3 of 5 ACR components: subject's global assessment of arthritis pain SGAP (100mm visual analog scale VAS; score 0=no pain, score 100=very severe pain), subject's global assessment of arthritis SGA (100mm VAS; score 0=no disease activity, score 100mm=very severe disease activity), PGA (100mm VAS; score 0=no disease activity, score 100mm=very severe disease activity), Health Assessment Questionnaire-Disability Index HAQ-DI (score from 0 to 3, higher score=greater disability), CRP (mg/dL, higher values= >inflammation). Patient defined as a non-responder if the patient was not a responder.	
End point type	Primary
End point timeframe: Week 12	

End point values	Placebo	ASP015K 25 mg once daily	ASP015K 50 mg once daily	ASP015K 100 mg once daily
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	51	59	57	58
Units: Percentage				
number (not applicable)				
Responder	29.4	22	36.8	48.3

Non-Responder	70.6	78	63.2	51.7
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<b>End point values</b>	ASP015K 150 mg once daily			
Subject group type	Reporting group			
Number of subjects analysed	64			
Units: Percentage				
number (not applicable)				
Responder	56.3			
Non-Responder	43.8			

## Statistical analyses

<b>Statistical analysis title</b>	Statistical analysis 1
Statistical analysis description:	
LOCF: Last Observation Carried Forward for missing ACR20 components. NRI: Non-Responder Imputation for missing ACR response. ACR components were LOCFed first and then ACR20 response was calculated. In addition, all subjects with RA rescue therapy prior to or at Week 12 were classified as nonresponders.	
Comparison groups	Placebo v ASP015K 25 mg once daily
Number of subjects included in analysis	110
Analysis specification	Pre-specified
Analysis type	other
P-value	= 0.005 <sup>[1]</sup>
Method	Regression, Logistic
Parameter estimate	Odds ratio (OR)
Point estimate	0.68
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.28
upper limit	1.61

Notes:

[1] - The odds ratio (OR > 1 favors ASP015K) and P value were based on a logistic regression model with effects for treatment group and geographic region. P < 0.01 based on a logistic regression model; #P < 0.05, ##P < 0.01 based on normal approximation.

<b>Statistical analysis title</b>	Statistical analysis 2
Statistical analysis description:	
LOCF: Last Observation Carried Forward for missing ACR20 components. NRI: Non-Responder Imputation for missing ACR response. ACR components were LOCFed first and then ACR20 response was calculated. In addition, all subjects with RA rescue therapy prior to or at Week 12 were classified as nonresponders.	
Comparison groups	Placebo v ASP015K 50 mg once daily

Number of subjects included in analysis	108
Analysis specification	Pre-specified
Analysis type	other
P-value	= 0.805 <sup>[2]</sup>
Method	Regression, Logistic
Parameter estimate	Odds ratio (OR)
Point estimate	1.38
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.61
upper limit	3.13

Notes:

[2] - The odds ratio (OR > 1 favors ASP015K) and P value were based on a logistic regression model with effects for treatment group and geographic region.

<b>Statistical analysis title</b>	Statistical analysis 3
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Statistical analysis description:

LOCF: Last Observation Carried Forward for missing ACR20 components. NRI: Non-Responder Imputation for missing ACR response. ACR components were LOCFed first and then ACR20 response was calculated. In addition, all subjects with RA rescue therapy prior to or at Week 12 were classified as nonresponders.

Comparison groups	Placebo v ASP015K 100 mg once daily
Number of subjects included in analysis	109
Analysis specification	Pre-specified
Analysis type	other
P-value	= 0.054 <sup>[3]</sup>
Method	Regression, Logistic
Parameter estimate	Odds ratio (OR)
Point estimate	2.35
Confidence interval	
level	95 %
sides	2-sided
lower limit	1.06
upper limit	5.23

Notes:

[3] - The odds ratio (OR > 1 favors ASP015K) and P value were based on a logistic regression model with effects for treatment group and geographic region.

<b>Statistical analysis title</b>	Statistical analysis 4
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Statistical analysis description:

LOCF: Last Observation Carried Forward for missing ACR20 components. NRI: Non-Responder Imputation for missing ACR response. ACR components were LOCFed first and then ACR20 response was calculated. In addition, all subjects with RA rescue therapy prior to or at Week 12 were classified as nonresponders.

Comparison groups	Placebo v ASP015K 150 mg once daily
Number of subjects included in analysis	115
Analysis specification	Pre-specified
Analysis type	other
P-value	= 0.001 <sup>[4]</sup>
Method	Regression, Logistic
Parameter estimate	Odds ratio (OR)
Point estimate	3.15

Confidence interval	
level	95 %
sides	2-sided
lower limit	1.44
upper limit	6.92

Notes:

[4] - The odds ratio (OR > 1 favors ASP015K) and P value were based on a logistic regression model with effects for treatment group and geographic region. P < 0.01 based on a logistic regression model; #P < 0.05, ##P < 0.01 based on normal approximation.

### Primary: Trough plasma concentration of ASP015K and metabolites

End point title	Trough plasma concentration of ASP015K and metabolites <sup>[5][6]</sup>
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End point description:

The study analysis population consisted of the Pharmacokinetic Analysis Set (PKAS). The PKAS consisted of all patients who received at least 1 dose of study drug and who had values of drug concentration for at least 1 time point.

End point type	Primary
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End point timeframe:

Up to week 12.

Notes:

[5] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.

Justification: Descriptive statistics have been summarized for trough plasma concentrations of ASP015K, and metabolites by active treatment group and time point for each analyte.

[6] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.

Justification: This pharmacokinetic (PK) endpoint pertained to only those arms/subject analysis sets with ASP015K treatment since it measured the trough plasma concentration of ASP015K and metabolites. This was not applicable to the placebo treatment arm.

End point values	ASP015K 25 mg once daily	ASP015K 50 mg once daily	ASP015K 100 mg once daily	ASP015K 150 mg once daily
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	59 <sup>[7]</sup>	57 <sup>[8]</sup>	58 <sup>[9]</sup>	64 <sup>[10]</sup>
Units: ng/mL				
arithmetic mean (standard deviation)				
Baseline	0.754 (± 5.6392)	3.004 (± 22.482)	6.485 (± 48.9613)	0.781 (± 5.3492)
Week 1	0.881 (± 1.1244)	1.472 (± 1.1549)	3.023 (± 2.4352)	8.286 (± 26.5097)
Week 2	1.631 (± 5.9792)	1.373 (± 0.9128)	6.184 (± 21.8638)	14.356 (± 46.1079)
Week 4	2.215 (± 5.7659)	1.745 (± 2.1049)	3.145 (± 4.4099)	10.174 (± 33.6779)
Week 8	1.022 (± 2.0704)	1.842 (± 1.7768)	5.614 (± 15.026)	6.477 (± 6.2216)
Week 12	1.034 (± 1.5076)	2.172 (± 2.1518)	3.615 (± 3.8422)	5.964 (± 5.2095)

Notes:

[7] - [N= Baseline/57, Week 1/45, Week 2/46, Week 4/42, Week 8/41, Week 12/42]

[8] - [N= Baseline/56, Week 1/45, Week 2/51, Week 4/45, Week 8/43, Week 12/44]

[9] - [N= Baseline/57, Week 1/43, Week 2/47, Week 4/48, Week 8/46, Week 12/45]

[10] - [N= Baseline/63, Week 1/49, Week 2/52, Week 4/48, Week 8/49, Week 12/44]

End point values	H1 Metabolite - ASP015K 25 mg (PKAS)	H1 Metabolite - ASP015K 50 mg (PKAS)	H1 Metabolite - ASP015K 100 mg (PKAS)	H1 Metabolite - ASP015K 150 mg (PKAS)
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Subject group type	Subject analysis set	Subject analysis set	Subject analysis set	Subject analysis set
Number of subjects analysed	59 <sup>[11]</sup>	57 <sup>[12]</sup>	58 <sup>[13]</sup>	64 <sup>[14]</sup>
Units: ng/mL				
arithmetic mean (standard deviation)				
Baseline	0.039 (± 0.298)	0.036 (± 0.2673)	0.989 (± 7.4704)	0.099 (± 0.7862)
Week 1	2.072 (± 3.2626)	2.748 (± 1.9102)	7.471 (± 8.0531)	14.436 (± 26.3264)
Week 2	2.156 (± 4.0801)	2.789 (± 2.1451)	7.453 (± 10.1198)	12.642 (± 17.5732)
Week 4	1.824 (± 2.3861)	3.069 (± 2.7708)	6.617 (± 10.5697)	13.6 (± 22.7147)
Week 8	1.475 (± 1.0352)	3.819 (± 4.0106)	7.738 (± 16.2141)	10.932 (± 21.8831)
Week 12	1.369 (± 1.3726)	4.363 (± 5.3775)	5.24 (± 5.7651)	11.484 (± 28.8065)

Notes:

[11] - [N= Baseline/57, Week 1/45, Week 2/46, Week 4/44, Week 8/42, Week 12/43]

[12] - [N= Baseline/56, Week 1/45, Week 2/52, Week 4/43, Week 8/45, Week 12/43]

[13] - [N= Baseline/57, Week 1/44, Week 2/47, Week 4/49, Week 8/45, Week 12/45]

[14] - [N= Baseline/63, Week 1/48, Week 2/51, Week 4/48, Week 8/50, Week 12/44]

End point values	H2 Metabolite - ASP015K 25 mg (PKAS)	H2 Metabolite - ASP015K 50 mg (PKAS)	H2 Metabolite - ASP015K 100 mg (PKAS)	H2 Metabolite - ASP015K 150 mg (PKAS)
Subject group type	Subject analysis set	Subject analysis set	Subject analysis set	Subject analysis set
Number of subjects analysed	59 <sup>[15]</sup>	57 <sup>[16]</sup>	58 <sup>[17]</sup>	64 <sup>[18]</sup>
Units: ng/mL				
arithmetic mean (standard deviation)				
Baseline	0.861 (± 6.5035)	5.674 (± 42.4611)	13.729 (± 103.6539)	0.309 (± 2.005)
Week 1	2.408 (± 3.4033)	5.27 (± 8.5534)	10.613 (± 9.4295)	44.534 (± 176.3971)
Week 2	4.383 (± 15.9018)	5.436 (± 8.5164)	11.998 (± 16.0264)	36.376 (± 113.6776)
Week 4	5.23 (± 16.3477)	5.952 (± 6.2121)	10.688 (± 15.8643)	43.166 (± 162.0641)
Week 8	2.448 (± 4.2744)	9.028 (± 19.397)	18.554 (± 47.2131)	35.541 (± 139.4458)
Week 12	2.464 (± 3.7308)	8.372 (± 11.7188)	13.515 (± 22.8604)	20.289 (± 40.9056)

Notes:

[15] - [N= Baseline/57, Week 1/44, Week 2/46, Week 4/44, Week 8/41, Week 12/42]

[16] - [N= Baseline/56, Week 1/45, Week 2/52, Week 4/44, Week 8/43, Week 12/41]

[17] - [N= Baseline/57, Week 1/43, Week 2/47, Week 4/49, Week 8/45, Week 12/45]

[18] - [N= Baseline/63, Week 1/48, Week 2/51, Week 4/47, Week 8/49, Week 12/44]

End point values	H4 Metabolite - ASP015K 25 mg (PKAS)	H4 Metabolite - ASP015K 50 mg (PKAS)	H4 Metabolite - ASP015K 100 mg (PKAS)	H4 Metabolite - ASP015K 150 mg (PKAS)
Subject group type	Subject analysis set	Subject analysis set	Subject analysis set	Subject analysis set
Number of subjects analysed	59 <sup>[19]</sup>	57 <sup>[20]</sup>	58 <sup>[21]</sup>	64 <sup>[22]</sup>
Units: ng/mL				
arithmetic mean (standard deviation)				
Baseline	0.116 (± 0.8729)	0.112 (± 0.8379)	0.57 (± 4.3061)	0.077 (± 0.4962)
Week 1	1.114 (± 0.9671)	1.903 (± 1.4679)	3.463 (± 2.402)	8.409 (± 16.5609)

Week 2	1.326 (± 2.1325)	1.783 (± 1.0238)	3.77 (± 3.5126)	7.043 (± 7.8633)
Week 4	1.449 (± 2.0105)	2.16 (± 2.1099)	3.347 (± 3.7267)	9.317 (± 18.2902)
Week 8	1.078 (± 1.2251)	2.707 (± 3.0481)	4.776 (± 10.8524)	7.027 (± 6.0709)
Week 12	1.013 (± 1.0075)	3.318 (± 5.5703)	3.204 (± 2.689)	6.603 (± 5.95)

Notes:

[19] - [N= Baseline/57, Week 1/46, Week 2/46, Week 4/44, Week 8/41, Week 12/44]

[20] - [N= Baseline/56, Week 1/45, Week 2/52, Week 4/44, Week 8/45, Week 12/44]

[21] - [N= Baseline/57, Week 1/44, Week 2/47, Week 4/49, Week 8/46, Week 12/44]

[22] - [N= Baseline/63, Week 1/49, Week 2/51, Week 4/48, Week 8/48, Week 12/44]

## Statistical analyses

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No statistical analyses for this end point

## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

A treatment-emergent AE (TEAE) was defined as any AE that started or worsened in severity after initial dose of study drug through the follow-up period.

Adverse event reporting additional description:

An adverse event was any untoward medical occurrence in a patient administered a study drug and which did not necessarily have a causal relationship with the treatment. Adverse events were based on the Safety Analysis Set (SAF) population. The SAF was defined as all patients who received at least 1 dose of study drug.

Assessment type	Systematic
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### Dictionary used

Dictionary name	MedDRA
Dictionary version	14.0

### Reporting groups

Reporting group title	Placebo
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Reporting group description: -

Reporting group title	ASP015K 25 mg once daily
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Reporting group description: -

Reporting group title	ASP015K 50 mg
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Reporting group description: -

Reporting group title	ASP015K 100 mg
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Reporting group description: -

Reporting group title	ASP015K 150 mg
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Reporting group description: -

Serious adverse events	Placebo	ASP015K 25 mg once daily	ASP015K 50 mg
Total subjects affected by serious adverse events			
subjects affected / exposed	2 / 51 (3.92%)	2 / 59 (3.39%)	2 / 57 (3.51%)
number of deaths (all causes)	0	0	0
number of deaths resulting from adverse events	0	0	0
Investigations			
Electrocardiogram abnormal			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Injury, poisoning and procedural complications			
Humerus fracture			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0



Joint dislocation			
subjects affected / exposed	1 / 51 (1.96%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Cardiac disorders			
Myocardial infarction			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Atrial fibrillation			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	1 / 57 (1.75%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Myocardial ischaemia			
subjects affected / exposed	1 / 51 (1.96%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Nervous system disorders			
Transient ischaemic attack			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Respiratory, thoracic and mediastinal disorders			
Asthma			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	1 / 57 (1.75%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Haemoptysis			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	1 / 57 (1.75%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Pleuritic pain			

subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
<b>Musculoskeletal and connective tissue disorders</b>			
Musculoskeletal chest pain			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Rheumatoid arthritis			
subjects affected / exposed	0 / 51 (0.00%)	1 / 59 (1.69%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Synovial cyst			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
<b>Infections and infestations</b>			
Abscess limb			
subjects affected / exposed	0 / 51 (0.00%)	1 / 59 (1.69%)	0 / 57 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

<b>Serious adverse events</b>	ASP015K 100 mg	ASP015K 150 mg	
Total subjects affected by serious adverse events			
subjects affected / exposed	4 / 58 (6.90%)	2 / 64 (3.13%)	
number of deaths (all causes)	0	0	
number of deaths resulting from adverse events	0	0	
<b>Investigations</b>			
Electrocardiogram abnormal			
subjects affected / exposed	1 / 58 (1.72%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
<b>Injury, poisoning and procedural complications</b>			
Humerus fracture			

subjects affected / exposed	1 / 58 (1.72%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Joint dislocation			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Cardiac disorders			
Myocardial infarction			
subjects affected / exposed	0 / 58 (0.00%)	1 / 64 (1.56%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Atrial fibrillation			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Myocardial ischaemia			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Nervous system disorders			
Transient ischaemic attack			
subjects affected / exposed	2 / 58 (3.45%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	1 / 2	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Respiratory, thoracic and mediastinal disorders			
Asthma			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Haemoptysis			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Pleuritic pain			
subjects affected / exposed	0 / 58 (0.00%)	1 / 64 (1.56%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Musculoskeletal and connective tissue disorders			
Musculoskeletal chest pain			
subjects affected / exposed	0 / 58 (0.00%)	1 / 64 (1.56%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Rheumatoid arthritis			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Synovial cyst			
subjects affected / exposed	1 / 58 (1.72%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Infections and infestations			
Abscess limb			
subjects affected / exposed	0 / 58 (0.00%)	0 / 64 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Frequency threshold for reporting non-serious adverse events: 5 %

<b>Non-serious adverse events</b>	Placebo	ASP015K 25 mg once daily	ASP015K 50 mg
Total subjects affected by non-serious adverse events			
subjects affected / exposed	21 / 51 (41.18%)	21 / 59 (35.59%)	18 / 57 (31.58%)
Nervous system disorders			
Headache			
subjects affected / exposed	1 / 51 (1.96%)	1 / 59 (1.69%)	0 / 57 (0.00%)
occurrences (all)	1	1	0
Gastrointestinal disorders			
Diarrhoea			

subjects affected / exposed	1 / 51 (1.96%)	4 / 59 (6.78%)	1 / 57 (1.75%)
occurrences (all)	1	4	1
Nausea			
subjects affected / exposed	0 / 51 (0.00%)	2 / 59 (3.39%)	1 / 57 (1.75%)
occurrences (all)	0	2	1
Musculoskeletal and connective tissue disorders			
Rheumatoid arthritis			
subjects affected / exposed	1 / 51 (1.96%)	0 / 59 (0.00%)	3 / 57 (5.26%)
occurrences (all)	1	0	4
Infections and infestations			
Upper respiratory tract infection			
subjects affected / exposed	2 / 51 (3.92%)	4 / 59 (6.78%)	0 / 57 (0.00%)
occurrences (all)	2	4	0
Urinary tract infection			
subjects affected / exposed	2 / 51 (3.92%)	1 / 59 (1.69%)	0 / 57 (0.00%)
occurrences (all)	3	1	0
Metabolism and nutrition disorders			
Hypertriglyceridaemia			
subjects affected / exposed	0 / 51 (0.00%)	0 / 59 (0.00%)	1 / 57 (1.75%)
occurrences (all)	0	0	1

<b>Non-serious adverse events</b>	ASP015K 100 mg	ASP015K 150 mg	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	29 / 58 (50.00%)	28 / 64 (43.75%)	
Nervous system disorders			
Headache			
subjects affected / exposed	4 / 58 (6.90%)	1 / 64 (1.56%)	
occurrences (all)	5	2	
Gastrointestinal disorders			
Diarrhoea			
subjects affected / exposed	4 / 58 (6.90%)	0 / 64 (0.00%)	
occurrences (all)	4	0	
Nausea			
subjects affected / exposed	3 / 58 (5.17%)	6 / 64 (9.38%)	
occurrences (all)	3	6	
Musculoskeletal and connective tissue disorders			

Rheumatoid arthritis subjects affected / exposed occurrences (all)	0 / 58 (0.00%) 0	2 / 64 (3.13%) 2	
Infections and infestations Upper respiratory tract infection subjects affected / exposed occurrences (all)	4 / 58 (6.90%) 4	5 / 64 (7.81%) 5	
Urinary tract infection subjects affected / exposed occurrences (all)	2 / 58 (3.45%) 3	5 / 64 (7.81%) 5	
Metabolism and nutrition disorders Hypertriglyceridaemia subjects affected / exposed occurrences (all)	3 / 58 (5.17%) 3	1 / 64 (1.56%) 1	

## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
26 January 2012	<p>The changes included in Amendment 4 are summarized below:</p> <ul style="list-style-type: none"><li>• Dosing instructions revised to state "take with food"</li><li>• Screening period and safety follow-up period extended to 4 weeks (28 days) and 30 days, respectively</li><li>• The follow-up period for subject not rolling-over into the extension study extended to 30 days</li><li>• Clarifications and other administrative changes made</li></ul> <p>These changes to the protocol were included prior to the enrollment of any patients</p>
31 May 2012	<p>The changes included in Amendment 2 are summarized below:</p> <ul style="list-style-type: none"><li>• "Monotherapy" removed from trial design</li><li>• Allowed and prohibited concomitant medications updated</li><li>• Required washout periods for previous DMARDs updated</li><li>• Stratification by geographic region added</li><li>• Supine blood pressure requirement removed</li><li>• Estimated glomerular filtration rate (eGFR) calculation added</li><li>• Use of dosing diary added</li><li>• Clarifications and other administrative changes made</li></ul> <p>These changes to the protocol were included prior to the enrollment of any patients.</p>
05 December 2012	<p>The changes included in Amendment 3 (Czech Republic-specific amendment) are summarized below:</p> <ul style="list-style-type: none"><li>• Age limitation to only enroll patients under the age of 65 years added</li><li>• Language regarding compliance with local practice and guidance for tuberculosis screening via purified protein derivative skin testing added</li></ul> <p>These changes to the protocol were included prior to the enrollment of any patients in the Czech Republic.</p>
18 December 2012	<p>The changes included in Amendment 4 (Bulgaria-specific amendment) are summarized below:</p> <ul style="list-style-type: none"><li>• Eligible patient population as it relates to required prior RA treatment clarified</li></ul> <p>These changes to the protocol were included prior to the enrollment of any patients in Bulgaria.</p>
01 April 2013	<p>The changes included in Amendment 5 are summarized below:</p> <ul style="list-style-type: none"><li>• Number of planned sites revised</li><li>• Optional messenger RNA expression profiling included</li><li>• Allowed and prohibited concomitant medications updated</li><li>• Inclusion criteria revised to require a demonstrated inadequate response or intolerance to prior DMARD treatment</li><li>• Inclusion criteria revised to add contraception requirements for both men and women</li><li>• Exclusion criteria revised to include other malabsorption syndromes.</li><li>• Significant (absolute lymphocyte count [ALC] &lt; 750/mm<sup>3</sup>) or severe (ALC &lt; 500/mm<sup>3</sup>) lymphopenia added as an exclusion and discontinuation criteria, respectively</li><li>• Recording of prior rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) testing results added</li><li>• Clarifications and other administrative changes made</li></ul> <p>These changes to the protocol were included after the enrollment of approximately 97 patients, but did not affect the overall outcome of the study.</p>

05 June 2013	<p>The changes included in Amendment 6 (Czech Republic-specific amendment) are summarized below:</p> <ul style="list-style-type: none"> <li>• Inclusion criteria revised to include age cap at &lt; 65 years</li> </ul> <p>This change to the protocol was included after the enrollment of approximately 181 patients, but did not affect the overall outcome of the study.</p>
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Notes:

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## Interruptions (globally)

Were there any global interruptions to the trial? No

## Limitations and caveats

None reported