SUPPLEMENTARY MATERIAL

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Japan	Osaka City General Hospital	Hitoshi Goto
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List of institutional review board/independent ethics committee

Site Number	**Site Name**	**Name of institutional review board/independent ethics committee**
01	Juntendo University Hospital	Juntendo University Hospital Institutional Review Board
02	St. Luke's International Hospital	St. Luke's International Hospital Institutional Review Board
03	Katayama Seikeigeka Rheumatism Clinic	Toyooka Central Hospital Institutional Review Board
04	Tokyo Women's Medical University Hospital	Tokyo Women's Medical University Institutional Review Board
05	Tokyo Women's Medical University Yachiyo Medical Center	Tokyo Women's Medical University Institutional Review Board
06	Fujita Health University Hospital	Fujita Health University Hospital Institutional Review Board
07	Tenri Hospital	Tenri Hospital Institutional Review Board
08	Osaka University Hospital	Institutional Review Board of Osaka University Hospital
09	Osaka City University Hospital	Osaka City University Hospital Institutional Review Board
10	Osaka City General Hospital	Local Incorporated Administrative Agency Osaka City Hospital Organization Osaka City General Hospital Institutional Review Board
11	National Hospital Organization Osaka Minami Medical Center	National Hospital Organization Osaka Minami Medical Center Institutional Review Board
12	Yukioka Hospital	Tokai Memorial Hospital Institutional Review Board
13	Hyogo College of Medicine	Hyogo College of Medicine Institutional Review Board
14	Okayama Saiseikai General Hospital Outpatient Center	Okayama Saiseikai General Hospital Institutional Review Board
15	Kagawa University Hospital	Kagawa University Hospital Institutional Review Board
16	Kyushu University Hospital	Kyushu University Hospital Institutional Review Board

17	Fukuoka University Hospital	Fukuoka University Hospital Institutional Review Board
18	Okinawa Prefectural Chubu Hospital	Okinawa Prefectural Chubu Hospital Institutional Review Board
20	Sasebo Chuo Hospital	Sasebo Chuo Hospital Institutional Review Board
21	Tomishiro Central Hospital	Tomishiro Central Hospital Institutional Review Board
22	Hokkaido University Hospital	Hokkaido University Hospital Institutional Review Board
23	Toho University Ohashi Medical Center	Toho University Medical Center Institutional Review Board
25	Kochi Medical School Hospital	Kochi Medical School Hospital Institutional Review Board
28	Toho University Omori Medical Center	Toho University Medical Center Institutional Review Board
29	Chihaya Hospital	Haradoi Hospital Institutional Review Board
50	Kyung Hee University Hospital	Kyung Hee University Hospital Institutional Review Board
51	Inha University Hospital	Inha University Hospital Institutional Review Board
52	Chonnam National University Hospital	Chonnam National University Hospital Institutional Review Board
53	Ajou University Hospital	Ajou University Hospital Institutional Review Board
54	Chungnam National University Hospital	Chungnam National University Hospital Institutional Review Board
55	Hanyang University Seoul Hospital	Hanyang University Seoul Hospital Institutional Review Board
56	Daegu Catholic University Medical Center	Daegu Catholic University Medical Center Institutional Review Board
57	The catholic university of Korea Seoul St. Mary's Hospital	The Catholic University of Korea Seoul St. Mary's Hospital Institutional Review Board
58	Seoul National University Hospital	Seoul National University Hospital Institutional Review Board

59	Pusan National University Hospital	Pusan National University Hospital Institutional Review Board
60	Seoul National University Bundang Hospital	Seoul National University Bundang Hospital Institutional Review Board
61	Konkuk University Medical Center	Konkuk University Medical Center Institutional Review Board
70	Chung Shan Medical University Hospital	The Institution Review Board Chung Shan Medical University Hospital
71	Chang Gung Medical Foundation, Kaohsiung Chang Gung Memorial Hospital	Chang Gung Medical Foundation Institutional Review Board
72	Kaohsiung Medical University Chung-Ho Memorial Hospital	Kaohsiung Medical University Chung-Ho Memorial Hospital Institutional Review Board
73	China Medical University Hospital	China Medical University & Hospital Research Ethics Committee
74	Taichung Veterans General Hospital	Institutional Review Board I & II of Taichung Veterans General Hospital
75	National Cheng Kung University Hospital	Institutional Review Board, National Cheng Kung University Hospital
76	Chang Gung Medical Foundation, LinKou Chang Gung Memorial Hospital	Chang Gung Medical Foundation Institutional Review Board
77	Cathay General Hospital	Institutional Review Board of the Cathay General Hospital
78	Kaohsiung Veterans General Hospital	Kaohsiung Veterans General Hospital Institutional Review Board
79	National Taiwan University Hospital	Research Ethics Committee, National Taiwan University Hospital
80	Tri-Service General Hospital	Institutional Review Board, Tri-Service General Hospital

Table S1. Patient inclusion and exclusion criteria

Inclusion criteria
1) Personally submitted written voluntary informed consent to participate in the study (if a minor at the time of consent, written informed consent had to be obtained from his or her legally acceptable representative as well) 2) Aged ≥18 years at the time of consent (the cut-off age depended on the local law) 3) Patient with age at onset <45 years and continuous chronic back pain for ≥3 months fulfills the ASAS classification criteria of axSpA (with the exception of Crohn's disease) AS patients: Patient had radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) and at least one of the SpA features specified in the ASAS classification criteria of axSpA (with the exception of Crohn's disease) OR nr-axSpA patients: Patient did not have radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) AND Patient met either of the following criteria: • Presence of inflammatory lesions of sacroiliac joint on MRI of SPARCC level ≥2 (centrally read) and at least one of the SpA features specified in the ASAS classification criteria of axSpA (with the exception of Crohn's disease) • Positive test for HLA-B27* and the presence of at least 2 of the SpA features specified in the ASAS classification criteria of axSpA (with the exception of Crohn's disease), one of which had to be elevated CRP[†] (>ULN) 4) Patient had BASDAI score ≥4 at screening and enrollment

5) Patient had spinal pain score (BASDAI question #2) ≥4 at screening and enrollment 6) Patient had had adequate therapy with oral NSAIDs for back pain for at least 3 months with inadequate treatment response before enrollment (however, patients with contraindication or intolerance to oral NSAIDs might be enrolled even if the patient did not meet the above criterion). 7) For patients receiving non-biologic DMARDs (methotrexate or sulfasalazine): the patient had received treatment for ≥3 months prior to initiation of study drug, with a stable dose for ≥4 weeks prior to initiation of study drug. 8) For patient receiving oral corticosteroids: the patient had received treatment for ≥4 weeks prior to initiation of study drug. 9) No findings in chest X-ray (or chest CT scan) suggestive of active tuberculosis, meeting any of the following criteria at screening: • Negative QuantiFERON or T-spot test • “Borderline” or “invalid” result of QuantiFERON or T-spot test, and negative result in re-testing • “Borderline” result in re-testing QuantiFERON or T-spot test, and taking anti-tuberculosis agents (isoniazid, as a general rule) on a regular basis since at least 3 weeks before the start of study drug administration • Positive result in QuantiFERON or T-spot test (including retest) or "invalid" result in re-testing QuantiFERON or T-spot test, but no findings in chest CT scan suggestive of active tuberculosis, and taking anti-tuberculosis agents (isoniazid, as a general rule) on a regular basis since at least 3 weeks before the start of study drug administration.
Exclusion criteria
1) Complete ankylosis (fusion) of the spine 2) Active ongoing inflammatory diseases other than axSpA that might confound the evaluation of brodalumab therapy, including reactive arthritis, spondyloarthritis associated with inflammatory bowel disease, SAPHO syndrome (pustulotic arthro-osteitis), fibromyalgia, ankylosing spinal hyperostosis, osteitis condensans ilii, spondylosis deformans, or osteoarthritis sacroiliac joint disease 3) Planned surgical intervention between enrollment and week 16 4) Active infection or history of infections as follows: • Any active infection for which systemic anti-infectives were used within 4 weeks prior to the first study drug administration

- A serious infection, defined as requiring hospitalization or intravenous anti-infectives within 8 weeks prior to the first study drug administration
- Recurrent or chronic infections or other active infection that, in the opinion of the investigators, might cause this study to be detrimental to the patient

5) Any systemic disease (e.g., renal failure, heart failure, hypertension, liver disease, diabetes, anemia) considered by the investigators to be clinically significant and uncontrolled

6) Known history of HIV infection

7) Positive result in any item of the infection tests (HBs antigen, HBs antibody, HBc antibody, HCV antibody, HIV antigen/antibody, or HTLV-1 antibody) with the exception of the following cases:

- Negative HBs antigen and positive HBc antibody and/or HBs antibody and with a HBV-DNA level below the detection sensitivity (such patients were required to undergo the HBV-DNA assay at 4-week intervals). However, HBV-DNA measurement was not required for patients who were positive for antibodies produced after hepatitis B vaccination and who were not affected with hepatitis B at screening

8) History of myocardial infarction, unstable angina pectoris, or stroke within the past 12 months prior to the first study drug administration

9) Any active malignancy, including evidence of cutaneous basal or squamous cell carcinoma or melanoma

10) History of malignancy within 5 years prior to enrollment except treated and considered cured cutaneous basal or squamous cell carcinoma, in situ cervical cancer, or in situ breast ductal carcinoma

11) Any concurrent medical condition or electrocardiogram abnormality that, in the opinion of the investigators, could cause this study to be detrimental to the patient

12) History of Crohn's disease

13) Any of the following laboratory abnormalities at screening:

- Aspartate aminotransferase or alanine aminotransferase >2 × upper limit of normal
- Serum direct bilirubin ≥1.5 mg/dL (25.7 μmol/L)
- White blood cell count <3000/μL

- Neutrophil count <2000/μL

14) Any other laboratory abnormality that, in the opinion of the investigators, would prevent the patient from completing the study or would interfere with the interpretation of the study results

15) Use of DMARDs other than a stable dose of methotrexate or sulfasalazine, or history of having received live vaccine(s) within 4 weeks of the first dose of the study drug

16) Use of any narcotic analgesics (excluding tramadol) or medical marijuana within 1 week prior to enrollment

17) Prior history of >1 anti-TNF therapy

18) Patient had used commercially available or investigational biologic therapies as follows:

- Anti-TNF therapy: Within 4 weeks prior to study drug initiation for etanercept, within 8 weeks for infliximab, and within 10 weeks for other anti-TNF agents (e.g., adalimumab, golimumab, certolizumab-pegol)
- Anti-IL-17 biologics (e.g., brodalumab, secukinumab, ixekizumab)
- Anti-IL-12/IL-23 biologic therapy (e.g., ustekinumab, briakinumab) within 6 months prior to study drug initiation.

19) History of treatment with any intra-articular/intramuscular corticosteroids or systemic corticosteroids (other than oral corticosteroids) within 4 weeks before the start of study drug administration

20) History of participation in a clinical study with a drug other than brodalumab or with an unapproved medical device within 4 months before study drug administration in this study

21) Planned participation in another clinical study during this study

22) Known sensitivity to any of the products or components to be administered during dosing

23) Patient was not likely to complete all protocol-required study visits or procedures and/or to comply with all required study procedures to the best of the patient's and investigator's knowledge

24) History or evidence of suicidal ideation (severity of 4 or 5) or any suicidal behavior based on an assessment with the C-SSRS at enrollment

25) History or evidence of a psychiatric disorder, alcohol abuse, and/or substance abuse

26) Severe depression based on a total score of ≥15 on the PHQ-8 at enrollment (Note: patients with a total score of 10 to 14 on the PHQ-8 should be referred to a mental healthcare professional)

27) History or evidence of any other clinically significant disorder, condition, or disease (with the exception of those outlined above) that, in the opinion of the investigators, would pose a risk to patient safety or interfere with the study evaluation, procedures, or completion

28) Pregnant or lactating women or women who were willing to have a child within 8 weeks after the last dose of the study drug

29) Women of child-bearing potential (except for permanently sterilized, postmenopausal [defined as amenorrhea ≥12 consecutive months without an alternative medical cause], or anatomically not of childbearing potential) with a positive pregnancy test (assessed by a serum pregnancy test during screening and a urine pregnancy test at enrollment)

30) Women of child-bearing potential who did not agree to use effective contraception from the day of providing consent through 8 weeks after the last dose of the study drug. Fertile men who did not agree to use effective contraception through 8 weeks from the day of the first dose to after the last dose of the study drug. Effective contraception was defined as using any two of the following methods: condom, oral contraceptives, intrauterine contraceptive device, and diaphragm, or practice true abstinence from sexual intercourse. The investigators thoroughly explained the risks in pregnancy and the effective contraceptive methods to the patients

31) Anyone otherwise considered unsuitable for the study by the investigators

*Previous positive test result or positive result at screening

†Limited to the elevation of CRP (centrally measured) that was attributed to axSpA

AS, ankylosing spondylitis, ASAS, Assessment of SpondyloArthritis International Society; axSpA, axial spondyloarthritis; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; CRP, C-reactive protein; C-SSRS, Columbia-Suicide Severity Rating Scale; CT, computed tomography; DMARD, disease-modifying antirheumatic drug; DNA, deoxyribonucleic acid; HBc, hepatitis B core; HBs, hepatitis B surface; HBV, hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus; HLA, human leukocyte antigen; HTLV-1, human T-lymphotropic virus type 1; IL, interleukin; nr-axSpA, nonradiographic axial spondyloarthritis; NSAID, nonsteroidal anti-inflammatory drugs; MRI, magnetic resonance imaging; PHQ-8, Patient Health Questionnaire-8; SAPHO, synovitis, acne, pustulosis, hyperostosis, osteitis; SpA, spondyloarthritis; SPARCC, SpA Research Consortium of Canada level; TNF, tumor necrosis factor; ULN, upper limit of normal

Table S2. Protocol amendments in inclusion criteria for axSpA

Before Amendment	**After Amendment**	**Remarks**
Version 2.0 Patient fulfills the ASAS classification criteria for axSpA (with the exception of the Crohn's disease criterion) for >3 months AS: Patient has radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image must have been obtained ≤6 months from the time of screening; centrally read) OR nr-axSpA: Patient does not have radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image must have been obtained ≤6 months from the time of screening; centrally read)	Version 3.0 Patient with age at onset <45 years and continuous chronic back pain for ≥3 months fulfills the ASAS classification criteria for axSpA (with the exception of the Crohn's disease criterion) AS: Patient has radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) OR nr-axSpA: Patient does not have radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read)	Description of patients has been revised according to the ASAS classification criteria Timing of assessments was revised to clearly define the starting point for imaging
Version 3.0 Patient with age at onset <45 years and continuous chronic back pain for ≥3 months fulfills the ASAS classification criteria for axSpA (with the exception of the Crohn's disease criterion) AS patients: Patient has radiographic evidence	Version 4.0 Patient with age at onset <45 years and continuous chronic back pain for ≥3 months fulfills the ASAS classification criteria for axSpA (with the exception of the Crohn's disease criterion) AS patients: Patient has radiographic evidence	Patients who are positive for HLA-B27 and have at least two SpA features will also be enrolled in the study, according to the ASAS classification criteria One of the two SpA features must be elevated CRP, because the 2016 update of the ASAS-

of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) OR nr-axSpA patients: Patient does not have radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) AND Presence of inflammatory lesions of the sacroiliac joint on MRI of SPARCC level ≥2 (centrally read)	of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) and at least one of the SpA features specified in the ASAS classification criteria for axSpA (with the exception of Crohn's disease criterion) OR nr-axSpA patients: Patient does not have radiographic evidence of sacroiliitis grade ≥2 bilaterally or grade 3 to 4 unilaterally (image obtained within 6 months prior to the time of consent may be used; centrally read) AND Patient meets either of the following criteria: • Presence of inflammatory lesions of the sacroiliac joint on MRI of SPARCC level ≥2 (centrally read) and at least one of the SpA features specified in the ASAS classification criteria for axSpA (with the exception of Crohn's disease criterion) • Positive test for HLA-B27* and the presence of at least two of the SpA features specified in the ASAS classification criteria for axSpA (with the exception of Crohn's disease criterion), one of which must be elevated CRP[†] (>ULN)	EULAR management recommendations specify elevated CRP and MRI findings as diagnostic criteria for patients with axSpA who are eligible for treatment with biologics

*Previous positive test result or positive result at screening.
†Limited to the elevation of centrally measured CRP that is attributable to axSpA.
AS, ankylosing spondyloarthritis; ASAS, Assessment of SpondyloArthritis International Society; axSpA, axial spondyloarthritis; CRP, C-reactive protein; EULAR, European League Against Rheumatism; HLA, human leukocyte antigen; nr-axSpA, nonradiographic axial spondyloarthritis; MRI, magnetic resonance imaging; SpA, spondyloarthritis; SPARCC, Spondyloarthritis Research Consortium of Canada; ULN, upper limit of normal.

Table S3. List of EOI categories

EOI Label	**Identified Risks/ Potential Risks for Brodalumab**	**Search Strategy**
Neutrophil count decreased	Identified risks	Sponsor-defined EOI
Serious infections	Identified risks	Infections and infestations (SOC) and serious AEs
Serious hypersensitivity	Identified risks	Hypersensitivity (SMQs) and serious AE
Malignancy	Potential risks	Malignancies (SMQs)
Inflammatory bowel disease	Potential risks	Sponsor-defined EOI, gastrointestinal ulceration (SMQ), and ischemic colitis (SMQs)
Suicide/self-injury–related events	Potential risks	Suicide/self-injury (SMQs)

AE, adverse event; EOI, event of interest; MedDRA, Medical Dictionary for Regulatory Activities; SMQ, standardized MedDRA queries; SOC, system organ class.

Table S4. Search list for PT for sponsor-defined EOI

Neutrophil Count Decreased	**Inflammatory Bowel Disease**
Autoimmune neutropenia	Colonic abscess
Band neutrophil count decreased	Crohn's disease
Band neutrophil percentage decreased	Enteritis
Benign ethnic neutropenia	Inflammatory bowel disease
CSF granulocyte count abnormal	Large intestinal ulcer perforation
CSF neutrophil count decreased	Metastatic cutaneous Crohn's disease
CSF polymorphonuclear cell count decreased	Small intestinal ulcer perforation
CSF white blood cell count decreased	
Cyclic neutropenia	
Differential white blood cell count abnormal	
Enteritis leukopenic	
Febrile neutropenia	
Granulocyte count decreased	
Granulocytopenia	
Granulocytopenia neonatal	
Idiopathic neutropenia	
Leukopenia	
Leukopenia neonatal	
Neutropenia	
Neutropenia neonatal	
Neutropenic colitis	
Neutropenic infection	
Neutropenic sepsis	

Neutrophil count abnormal	
Neutrophil count decreased	
Neutrophil percentage abnormal	
Neutrophil percentage decreased	
Radiation leukopenia	
White blood cell analysis abnormal	
White blood cell count abnormal	
White blood cell count decreased	

CSF, cerebrospinal fluid; EOI, event of interest; PT, preferred term.

Table S5. ASAS response in the overall population and subgroups

Population/Timepoint	**Brodalumab 210 mg n/N (%); 95% CI**	**Placebo n/N (%); 95% CI**
ASAS 40 response		
Overall population	N=80	N=79
Week 2	13/80 (16.3) (8.9, 26.2)	2/78 (2.6) (0.3, 9.0)
Week 4	21/79 (26.6) (17.3, 37.7)	9/74 (12.2) (5.7, 21.8)
Week 8	31/78 (39.7) (28.8, 51.5)	16/74 (21.6) (12.9, 32.7)
Week 12	26/75 (34.7) (24.0, 46.5)	19/71 (26.8) (16.9, 38.6)
Week 16	35/77 (45.5) (34.1, 57.2)	19/69 (27.5) (17.5, 39.6)
Week 16 (NRI)	35/80 (43.8) (32.7, 55.3)	19/79 (24.1) (15.1, 35.0)
Ankylosing spondylitis	N=63	N=62
Week 2	8/63 (12.7)| (5.6, 23.5)	1/61 (1.6) (0.0, 8.8)
Week 4	15/62 (24.2) (14.2, 36.7)	5/59 (8.5) (2.8, 18.7)
Week 8	23/61 (37.7) (25.6, 51.0)	12/59 (20.3) (11.0, 32.8)

Week 12	20/59 (33.9) (22.1, 47.4)	15/56 (26.8) (15.8, 40.3)
Week 16	29/60 (48.3) (35.2, 61.6)	16/55 (29.1) (17.6, 42.9)
Week 16 (NRI)	29/63 (46.0) (33.4, 59.1)	16/62 (25.8) (15.5, 38.5)
Nonradiographic axSpA	N=17	N=16
Week 2	5/17 (29.4) (10.3, 56.0)	1/16 (6.3) (0.2, 30.2)
Week 4	6/17 (35.3) (14.2, 61.7)	4/14 (28.6) (8.4, 58.1)
Week 8	8/17 (47.1) (23.0, 72.2)	4/14 (28.6) (8.4, 58.1)
Week 12	6/16 (37.5) (15.2, 64.6)	4/14 (28.6) (8.4, 58.1)
Week 16	6/17 (35.3) (14.2, 61.7)	3/14 (21.4) (4.7, 50.8)
Week 16 (NRI)	6/17 (35.3) (14.2, 61.7)	3/16 (18.8) (4.0, 45.6)
HLA-B27 positive	N=68	N=65
Week 2	10/68 (14.7) (7.3, 25.4)	2/64 (3.1) (0.4, 10.8)
Week 4	18/68 (26.5) (16.5, 38.6)	7/61 (11.5) (4.7, 22.2)
Week 8	27/68 (39.7)	14/61 (23.0)

	(28.0, 52.3)	(13.2, 35.5)
Week 12	23/66 (34.8) (23.5, 47.6)	15/59 (25.4) (15.0, 38.4)
Week 16	31/68 (45.6) (33.5, 58.1)	16/59 (27.1) (16.4, 40.3)
Week 16 (NRI)	31/68 (45.6) (33.5, 58.1)	16/65 (24.6) (14.8, 36.9)
HLA-B27 negative	N=12	N=14
Week 2	3/12 (25.0) (5.5, 57.2)	0/14 (0.0) (0.0, 23.2)
Week 4	3/11 (27.3) (6.0, 61.0)	2/13 (15.4) (1.9, 45.4)
Week 8	4/10 (40.0) (12.2, 73.8)	2/13 (15.4) (1.9, 45.4)
Week 12	3/9 (33.3) (7.5, 70.1)	4/12 (33.3) (9.9, 65.1)
Week 16	4/9 (44.4) (13.7, 78.8)	3/10 (30.0) (6.7, 65.2)
Week 16 (NRI)	4/12 (33.3) (9.9, 65.1)	3/14 (21.4) (4.7, 50.8)
CRP ≥ULN	N=50	N=53
Week 2	11/50 (22.0) (11.5, 36.0)	1/53 (1.9) (0.0, 10.1)
Week 4	16/49 (32.7) (19.9, 47.5)	7/49 (14.3) (5.9, 27.2)

Week 8	24/49 (49.0) (34.4, 63.7)	12/49 (24.5) (13.3, 38.9)
Week 12	19/47 (40.4) (26.4, 55.7)	14/47 (29.8) (17.3, 44.9)
Week 16	26/49 (53.1) (38.3, 67.5)	15/47 (31.9) (19.1, 47.1)
Week 16 (NRI)	26/50 (52.0) (37.4, 66.3)	15/53 (28.3) (16.8, 42.3)
CRP <ULN	N=30	N=26
Week 2	2/30 (6.7) (0.8, 22.1)	1/25 (4.0) (0.1, 20.4)
Week 4	5/30 (16.7) (5.6, 34.7)	2/25 (8.0) (1.0, 26.0)
Week 8	7/29 (24.1) (10.3, 43.5)	4/25 (16.0) (4.5, 36.1)
Week 12	7/28 (25.0) (10.7, 44.9)	5/24 (20.8) (7.1, 42.2)
Week 16	9/28 (32.1) (15.9, 52.4)	4/22 (18.2) (5.2, 40.3)
Week 16 (NRI)	9/30 (30.0) (14.7, 49.4)	4/26 (15.4) (4.4, 34.9)
ASAS 20 response		
Overall population	N=80	N=79
Week 2	34/80 (42.5) (31.5, 54.1)	13/78 (16.7) (9.2, 26.8)

Week 4	42/79 (53.2) (41.6, 64.5)	21/74 (28.4) (18.5, 40.1)
Week 8	50/78 (64.1) (52.4, 74.7)	27/74 (36.5) (25.6, 48.5)
Week 12	53/75 (70.7) (59.0, 80.6)	35/71 (49.3) (37.2, 61.4)
Week 16	54/77 (70.1) (58.6, 80.0)	33/69 (47.8) (35.6, 60.2)
Week 16 (NRI)	54/80 (67.5) (56.1, 77.6)	33/79 (41.8) (30.8, 53.4)

ASAS, Assessment of SpondyloArthritis International Society; axSpA, axial spondyloarthritis; CI, confidence interval; CRP, C-reactive protein; HLA, human leukocyte antigen; NRI, nonresponder imputation; ULN, upper limit of normal.

Table S6. ASAS 40 response by MRI status of sacroiliac joints in nr-axSpA subpopulation

	MRI positive n/N (%) (95% CI)		**MRI negative n/N (%) (95% CI)**	
Timepoint	**Brodalumab 210 mg N=14**	**Placebo N=14**	**Brodalumab 210 mg N=3**	**Placebo N=2**
Week 2	4/14 (28.6) (8.4, 58.1)	1/14 (7.1) (0.2, 33.9)	1/3 (33.3) (0.8, 90.6)	0/2 (0.0) (0.0, 84.2)
Week 4	5/14 (35.7) (12.8, 64.9)	4/12 (33.3) (9.9, 65.1)	1/3 (33.3) (0.8, 90.6)	0/2 (0.0) (0.0, 84.2)
Week 8	6/14 (42.9) (17.7, 71.1)	4/12 (33.3) (9.9, 65.1)	2/3 (66.7) (9.4, 99.2)	0/2 (0.0) (0.0, 84.2)
Week 12	5/13 (38.5) (13.9, 68.4)	4/12 (33.3) (9.9, 65.1)	1/3 (33.3) (0.8, 90.6)	0/2 (0.0) (0.0, 84.2)
Week 16	5/14 (35.7) (12.8, 64.9)	3/12 (25.0) (5.5, 57.2)	1/3 (33.3) (0.8, 90.6)	0/2 (0.0) (0.0, 84.2)
Week 16 (NRI)	5/14 (35.7) (12.8, 64.9)	3/14 (21.4) (4.7, 50.8)	1/3 (33.3) (0.8, 90.6)	0/2 (0.0) (0.0, 84.2)

CI, confidence interval; MRI, magnetic resonance imaging; NRI, nonresponder imputation

Table S7. Change from baseline in other measures at week 16 (full analysis set)

Patient-Reported Outcome	**Brodalumab 210 mg N=80**	**Placebo N=79**
BASFI*	–1.1 (1.8)	–0.7 (2.2)
BASDAI†	–2.9 (2.1)	–2.4 (1.9)
BASMI‡	–0.3 (1.2)	–0.1 (1.2)
ASQoL⌡	–3.7 (4.2)	–4.0 (3.9)
SF-36v2¶	9.9 (13.8)	10.6 (15.8)
Enthesitis count‖	–1.2 (2.5)	–1.1 (2.9)
Swollen joint count**	–0.9 (1.9)	–0.7 (4.5)
Average PGA of spinal pain	–2.99 (2.32)	–2.30 (2.56)
Total PGA of spinal pain††	–2.9 (2.3)	–2.3 (2.5)
Nocturnal PGA of spinal pain	–3.1 (2.5)	–2.3 (2.8)
PGA of axSpA‡‡	–2.8 (2.4)	–2.2 (2.5)

All data are mean (SD).
ASQoL, Ankylosing Spondylitis Quality of Life Questionnaire; axSpA, axial spondyloarthritis; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; BASMI, Bath Ankylosing Spondylitis Metrology Index; PGA, Patient Global Assessment; SD, standard deviation; SF-36v2, Short Form-36 Health Survey, version 2.
*BASFI is composed of ten items and uses an 11-point numerical rating scale labeled from “0=easy” to “10=impossible.”
†BASDAI is composed of six items and uses an 11-point numerical rating scale labeled from “0=none” to “10=very severe” for the first five items and “0=0 hours” to “10=2 or more hours” for the sixth item.
‡BASMI is composed of five indices that are scored based on observed values, and the total score (0-10) is used to assess spinal and hip joint mobility and leg position.
⌡ASQoL comprises 18 items and uses a dichotomous response scale (yes=1 or no=0) for each of the items, where “yes” indicates that axSpA has an adverse effect on

the quality of life. The ASQoL total score ranges from 0 to 18, with higher scores indicating worse quality of life.
[¶]The SF-36v2 contains 36 items and yields assessments of eight domains of health-related quality of life and is calculated based on the validation testing of a three-component model (Physical Component Summary, Mental Component Summary, and Role/Social Component Summary) of SF-36 scores.
[‖]The enthesitis count was defined as the number of "presence" assessed on 13 entheses using the Maastricht Ankylosing Spondylitis Enthesitis Score.
**Swollen joint count was defined as the number of "positive" assessed on 44 swollen joints.
[††]PGA of spinal pain is a two-item questionnaire and uses an 11-point numerical rating scale labeled from "0=no pain" to "10=most severe pain."
[‡‡]The PGA of axSpA is a single-item global measure of disease activity and uses an 11-point numerical rating scale labeled from "0=not active" to "10=very active."
The full analysis set consisted of all randomized patients associated with the assigned treatment excluding those who received no study drug or had no post-dosing efficacy data available.