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Rheumatoid Arthritis Program: Top-line Phase 2 Results

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This presentation includes forward-looking statements that relate to future events or our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to differ materially from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. We make such forward-looking statements pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and other federal securities laws. All statements other than statements of historical facts contained in this Quarterly Report on Form 6-K are forward-looking statements. Words such as, but not limited to, "believe," "expect," "anticipate," "estimate," "intend," "plan," "targets," "likely," "will," "would," "could," and similar expressions or phrases identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and future events and financial trends that we believe may affect our financial condition, results of operation, business strategy and financial needs. These statements may relate to, but are not limited to: expectations regarding the safety or efficacy of, or potential applications for, Mesoblast's adult stem cell technologies; expectations regarding the strength of Mesoblast's intellectual property, the timeline for Mesoblast's regulatory approval process, and the scalability and efficiency of manufacturing processes; expectations about Mesoblast's ability to grow its business and statements regarding its relationships with JCR Pharmaceuticals Co., Ltd, and Lonza and future benefits of those relationships; statements concerning Mesoblast's share price or potential market capitalization; and statements concerning Mesoblast's capital requirements and ability to raise future capital, among others. Forward-looking statements should not be read as a guarantee of future performance or results, and actual results may differ from the results anticipated in these forward-looking statements, and the differences may be material and adverse. You should read this presentation together with our financial statements and the notes related thereto, as well as the risk factors, in our most recently filed reports with the SEC or on our website. Uncertainties and risks that may cause Mesoblast's actual results, performance or achievements to be materially different from those which may be expressed or implied by such statements, include, without limitation: risks inherent in the development and commercialization of potential products; uncertainty of clinical trial results or regulatory approvals or clearances; government regulation; the need for future capital; dependence upon collaborators; and protection of our intellectual property rights, among others. Accordingly, you should not place undue reliance on these forward-looking statements. We do not undertake any obligations to publicly update or revise any forward-looking statements, whether as a result of new information, future developments or otherwise.

Greatest Unmet Need in Rheumatoid Arthritis: Biologic Refractory Patients

- In 2016, over 5m individuals are impacted by rheumatoid arthritis (RA) across the 7 major pharmaceutical markets (7MM) with ~70% suffering from moderate to severe disease[1,2]

- Major advances in the treatment of RA using biologic agents have resulted in a $15 billion global market in 2015, which is projected to grow to over $18 billion in 2024
  - Anti-TNFα therapy is the most common first line class of biologic agents across the 7 major markets for moderate-to-severe RA patients who have failed conventional DMARDs

- ~30% of patients do not respond to anti-TNFα therapy or fail to maintain an initial good response over time or experience adverse events leading to treatment discontinuation[3,4]
  - On average, maintenance rates for anti-TNFα therapy at 1 year is ~65% and drops to ~40% at 5 years
  - Switching to a second or third anti-TNFα product results in significantly lower efficacy than is seen with an anti-TNF agent in biologically naive patients

- In the United States, the anti-TNFα refractory population is the fastest growing branded market segment, projected to increase by 8% annually from 2015 to 2024[5]
  - Estimated 90k RA patients in the US are anti-TNFα refractor and receive a non-TNFα inhibitor/Jak Inhibitor representing ~ $2bn USD in 2015. This target population is expected to grow to ~178K in 2024 representing over $3.6bn USD.

[1] GlobalData Rheumatoid Arthritis Global Forecast 2013-2023
[2] Decision Resources: Disease Landscape & Forecast Immune and Inflammatory Disorders – Rheumatoid Arthritis January 2016
[3] Favalli, EG., Biggioggero, M., Marchesoni, A, et. al. (2014) Survival on treatment with second-line biologic therapy: a cohort study comparing cycling and swap strategies. Rheumatology 2014: 53:1664-1668
[4] Flouri, I., Markatseli, TE., Voulgari, P., et. al. (2014) Comparative effectiveness and survival of infliximab, adalimumab, and etanercept for rheumatoid arthritis patients in the Helllenic Registry of Biologics: Low rates of remission and 5-year drug survival
[5] Estimated from Decision Resources: Pharmacor– Rheumatoid Arthritis 2015

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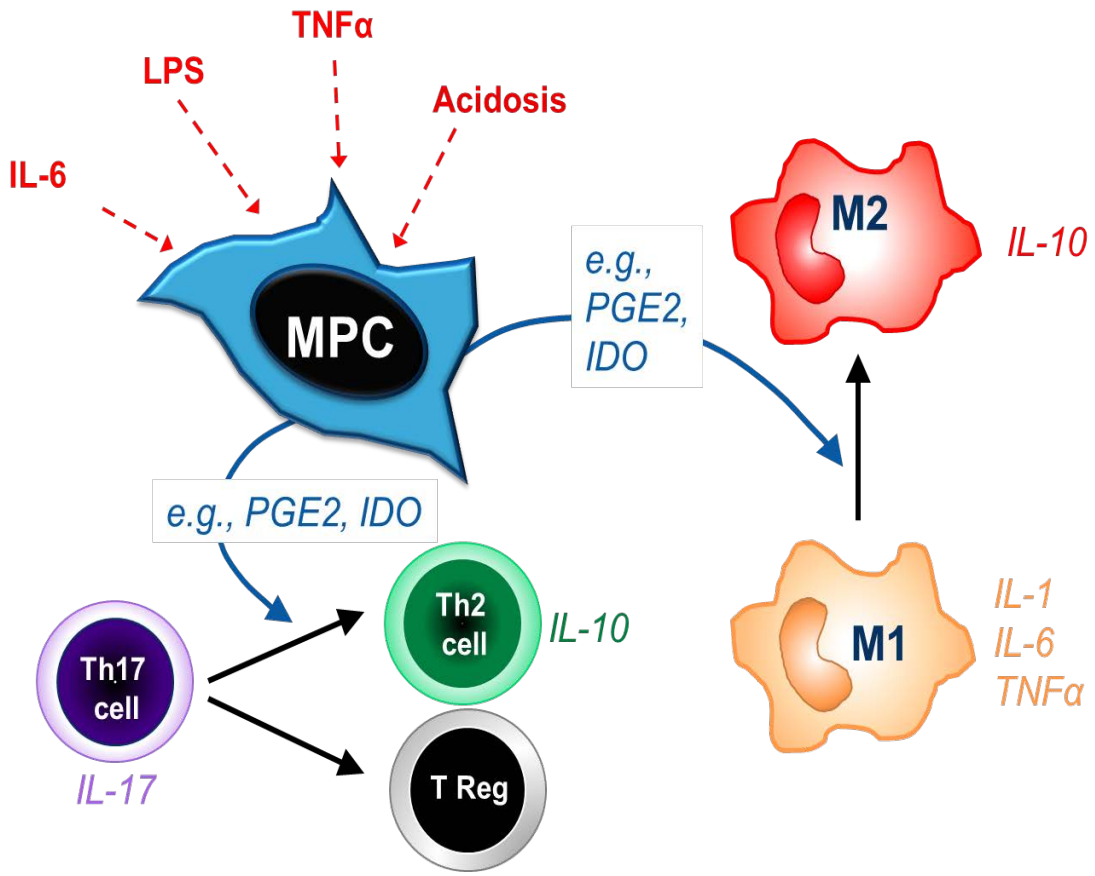
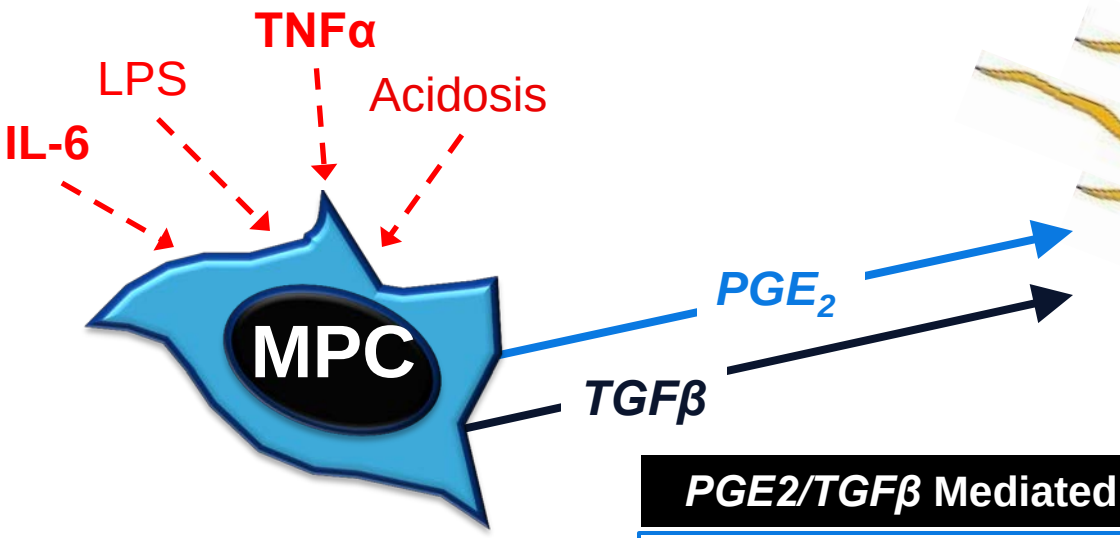
MPC-300-IV for Treatment of Chronic Inflammatory Diseases Through Immunomodulation

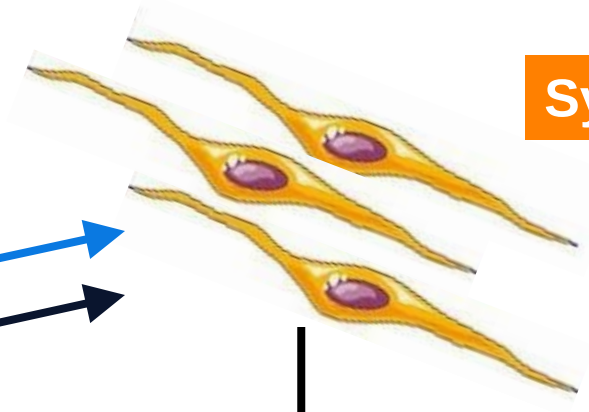
Inflammation induces production of immuno-modulatory factors by Mesenchymal Precursor Cells (MPCs), which regulate multiple immune pathways concurrently



- MPCs have receptors that respond to inflammatory signals, resulting in release of anti-inflammatory mediators
- Mesoblast is developing MPC product candidates to target immune mediated diseases where multiple pathways are associated with treatment resistant disease:
  - Biologic refractory rheumatoid arthritis
  - Diabetic kidney disease
  - Biologic refractory Crohn's disease
- MPCs have to date demonstrated a safe profile in terms of infectious or neoplastic complications

MPC-300-IV for Modulation Of Cytokine Production By Synoviocytes/Synovial Fibroblasts In Rheumatoid Arthritis

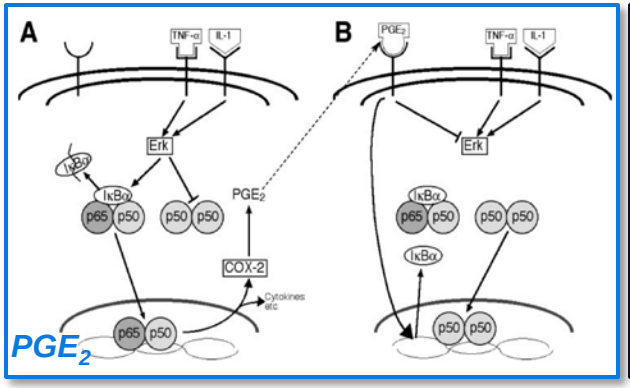




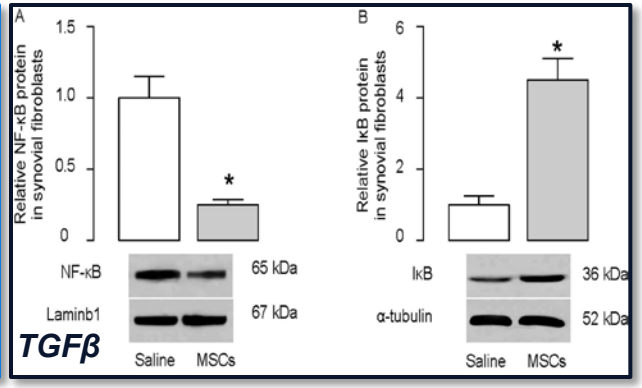
Synoviocytes

- PGE_2 and TGFβ secreted by MPCs following surface signaling in inflamed joint
- Both act directly on synovial fibroblasts to increase IkappaB and inhibit NFkappaB
- Secretion of inflammatory cytokines associated with joint pathology reduced

***PGE2/TGFβ* Mediated Inhibition of NF-κB in synoviocytes**



Gomez *et al.*, J Immunol 175: 6924 – 6930 (2005)

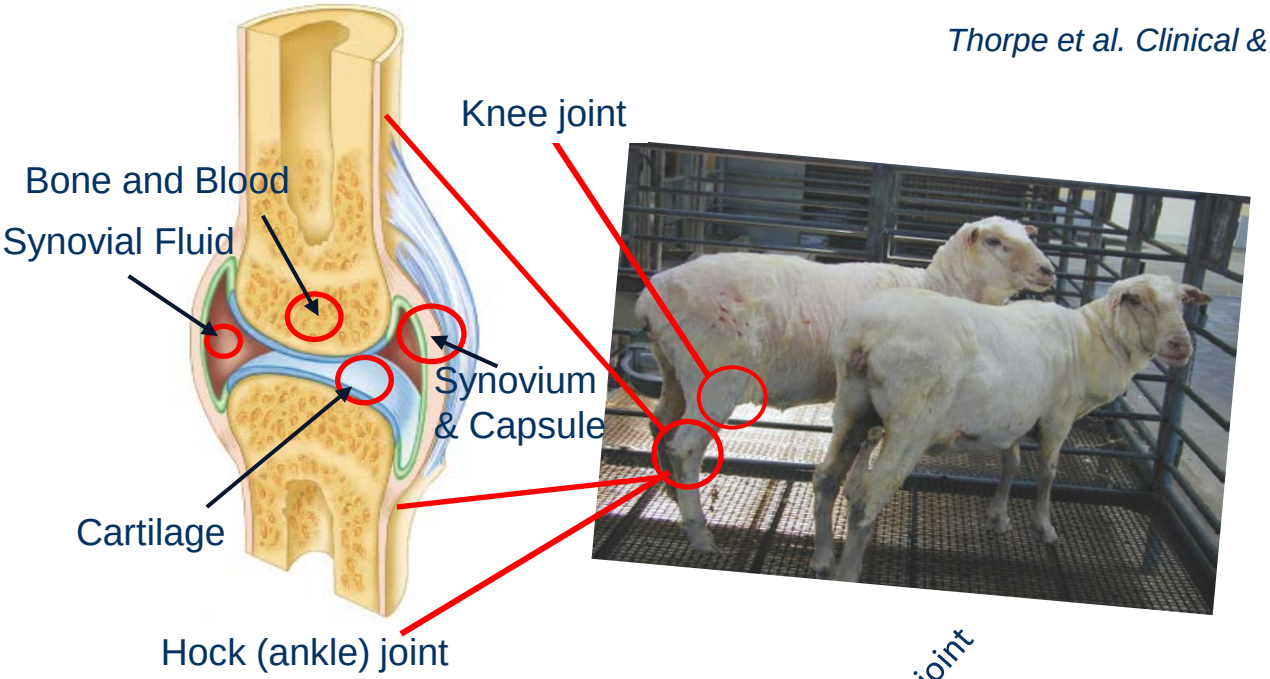


Yan *et al.*, Scientific Reports 6:28915 DOI: 10.1038, 1 – 12 (2016)

Reduced secretion of inflammatory mediators:
TNFα, IL-1, IL-6, IL-8, MCP-1, MMP-3, MMP-13

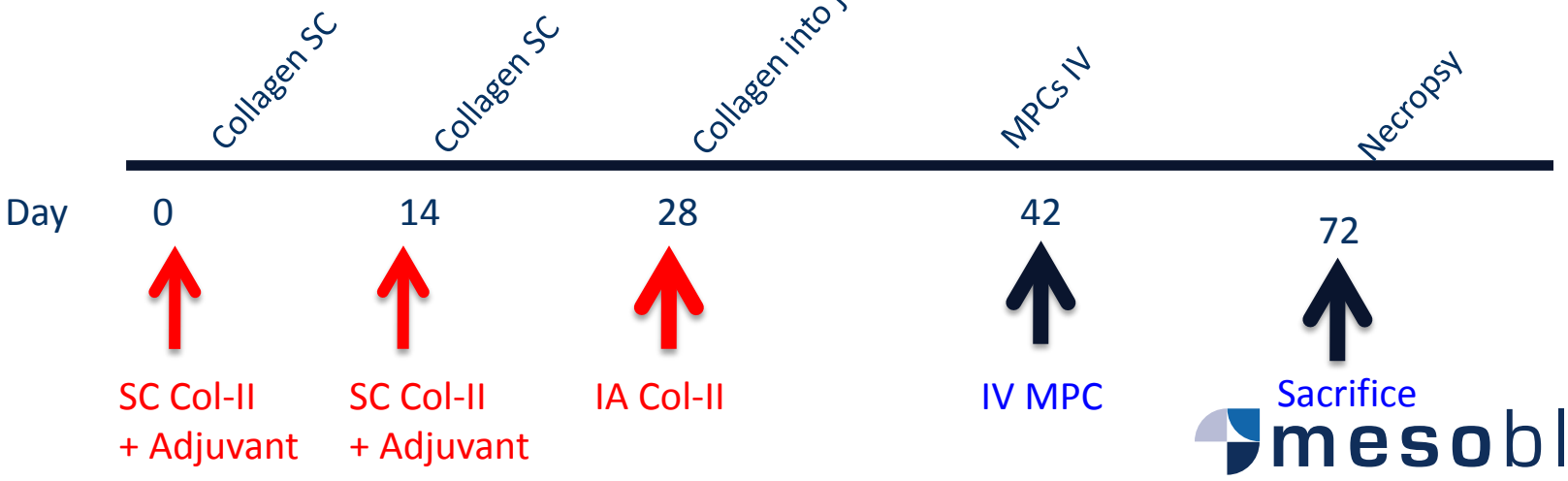
A Sheep Model of Collagen-Induced Arthritis (CIA)

*Thorpe et al. Clinical & Exp. Rheumatology **10**: 143 –150 (1992)*



Aim: to determine the anti-inflammatory effects and dose ranging of ovine MPCs in an ovine model of collagen-induced acute arthritis (CIA) and systemic inflammation

Doses: 25, 75, 150 million cryopreserved ovine MPCs administered by IV injection via the jugular vein



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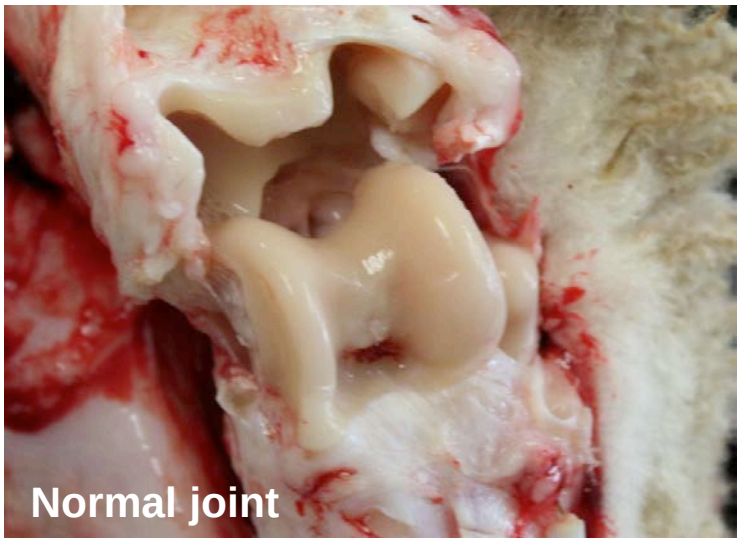
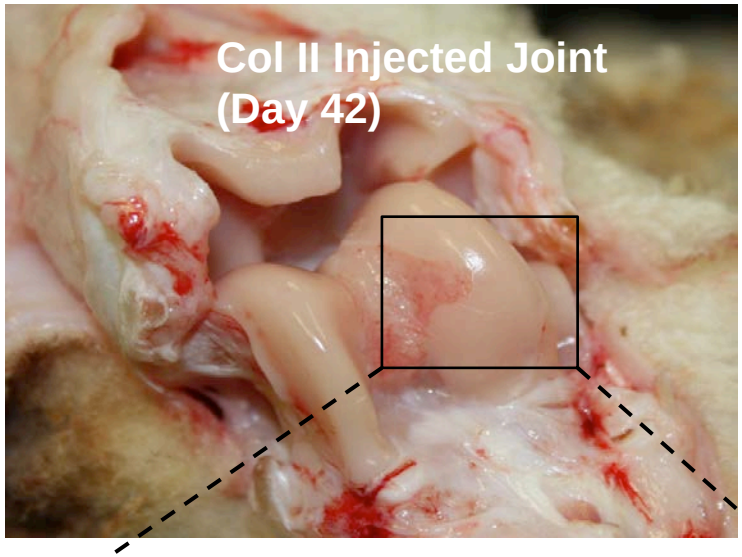
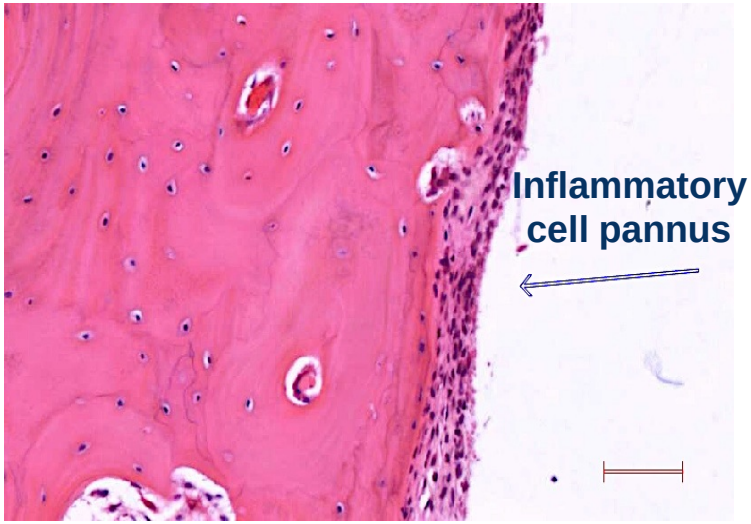
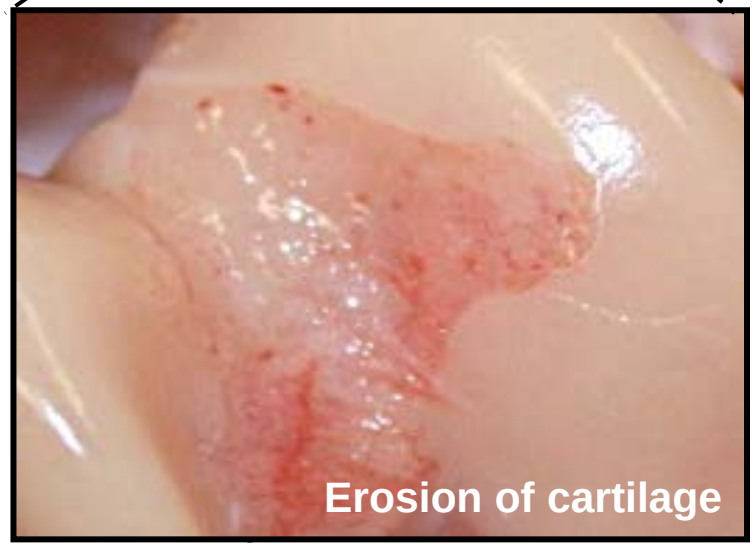
Features Of CIA And Human RA: Invading Synovial Pannus And Cartilage Erosion

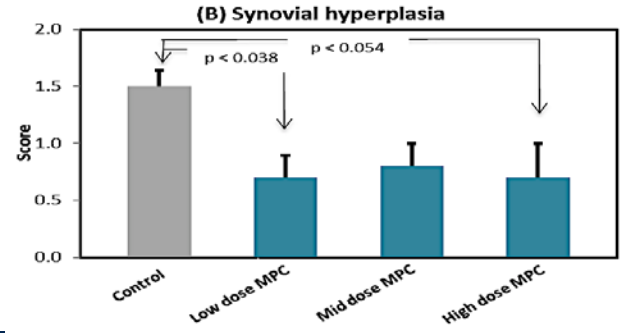


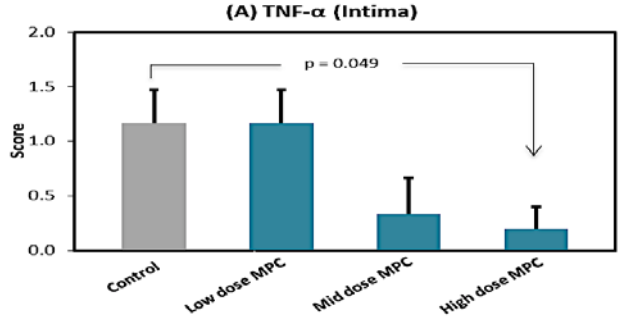


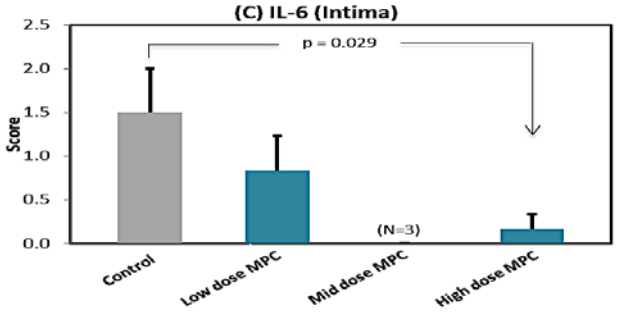


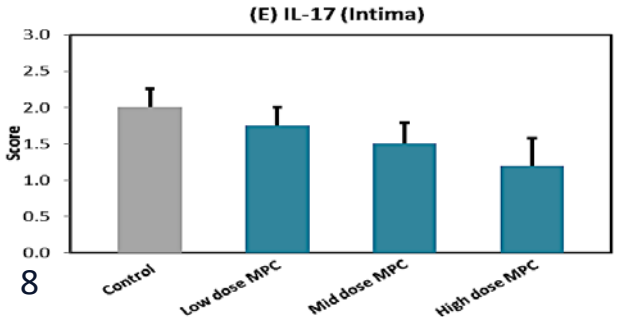


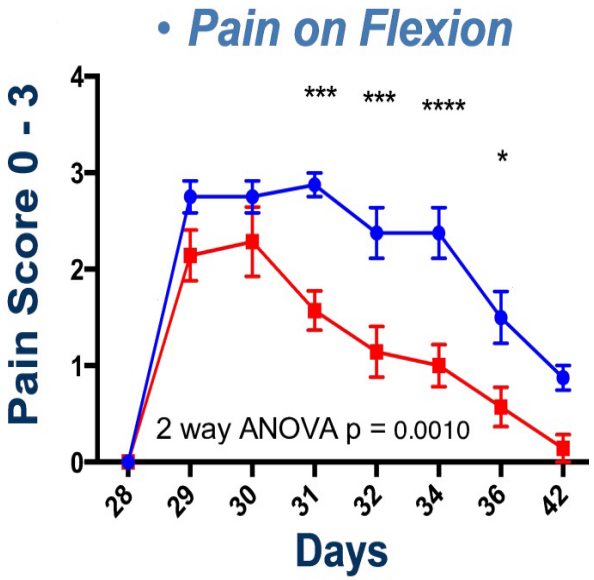
Allogeneic Sheep MPCs Reduce Synovial Pannus/ Inflammatory Cytokines, Improve Symptoms in CIA

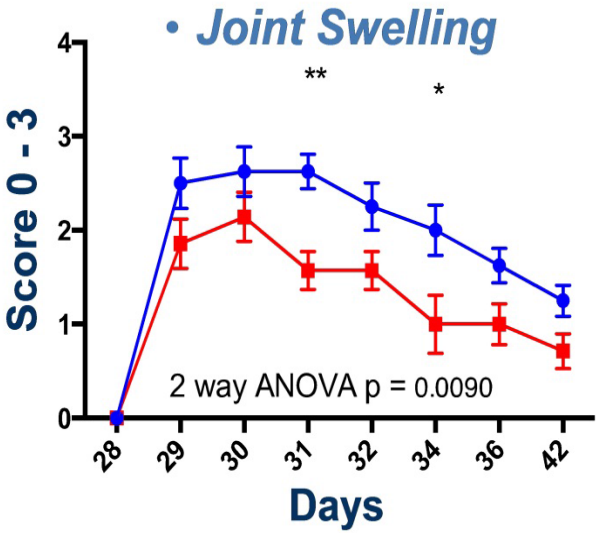


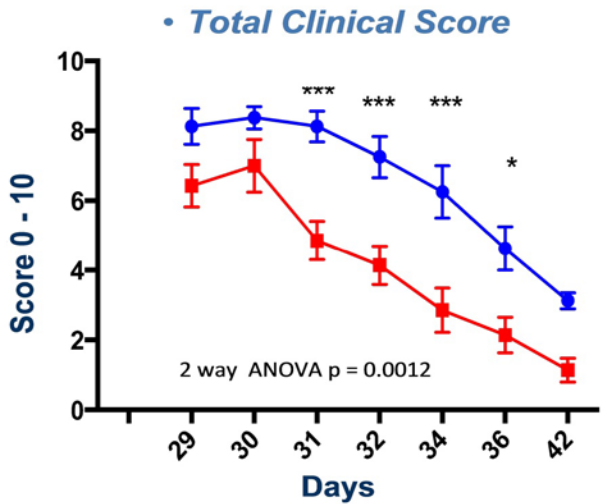












150 million MPC (N = 7)
Control Saline (N = 8)

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MSB-RA001 : Study Design

- Phase 2 double-blind, randomized, placebo-controlled, dose-escalating study comparing a single infusion of two MPC doses (1M/kg and 2M/kg) with placebo in patients with active RA
  - Inadequate response to at least 1 anti-TNF +/- other biologics
  - On a stable regimen methotrexate for >4 months +/- DMARDs for >3 months
  - + RF and/or anti-CCP*; ≥ 4 swollen/tender joints; ESR or CRP > upper limit of normal

- 48 patients enrolled at 14 sites in US and Australia**
  - MPC 1 x 10^6 cells/kg (N=16 active)
  - MPC 2 x 10^6 cells/kg (N=16)
  - Placebo (N=16)

- Objectives
  - Primary: Evaluate safety and tolerability of a single intravenous MPC infusion in biologic refractory RA patients through a 12-week primary endpoint
  - Secondary: Evaluate clinical efficacy through the 12-week primary endpoint and assess durability of clinical effects and safety through the full 52 week study
  - Pre-specified efficacy endpoints include the American College of Rheumatology (ACR) composite clinical response, the health assessment questionnaire-disability index (HAQ-DI), and the DAS28 composite measurement of disease activity; analyses were applied to the whole study population and the pre-specified exploratory subgroup based on whether the subjects had previously received 1-2 or ≥3 biologic agents.

**RF=Rheumatoid factor; anti-CCP=Cyclic citrullinated peptide antibody*

*** ClinicalTrials.gov Identifier: NCT01851070*

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MSB-RA001 : Safety Summary

- All infusions were well-tolerated without any acute infusion reactions or adverse events (AEs) reported either during infusion or the 6-h post-infusion monitoring period
- No serious AEs (SAEs) were reported during the 12- week primary study period
- No discontinuations due to AEs during the 12-week primary study period
- Treatment-emergent adverse events (TEAEs) reported by 12 (75%), 13 (81%) and 10 (63%) of patients in the placebo and MPC 1M/kg and 2M/kg groups, respectively
- The safety profile over 12 weeks was comparable among the placebo and two MPC treatment groups

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Profile of Marketed Non-TNFα/JAK Inhibitors Suggest Clinical Need for Agents with Reduced Safety Risk

- To date, no safety concerns have been identified with MPC-300-IV across multiple therapeutic indications, including in biologic refractory RA patients
- Currently marketed non-TNFα Inhibitors are associated with serious adverse events such as serious infections, malignancies, cardiovascular, and hepatic abnormalities that may limit initiation of therapy and/or lead to discontinuation
- Given the risk profile of non-TNFα Inhibitors, ongoing clinical need exists for new agents that are efficacious and offer a reduced safety profile in the biologic refractory population
- Mesoblast MPC-300-IV has the potential to address this unmet medical need

*Source: FDA Package Insert

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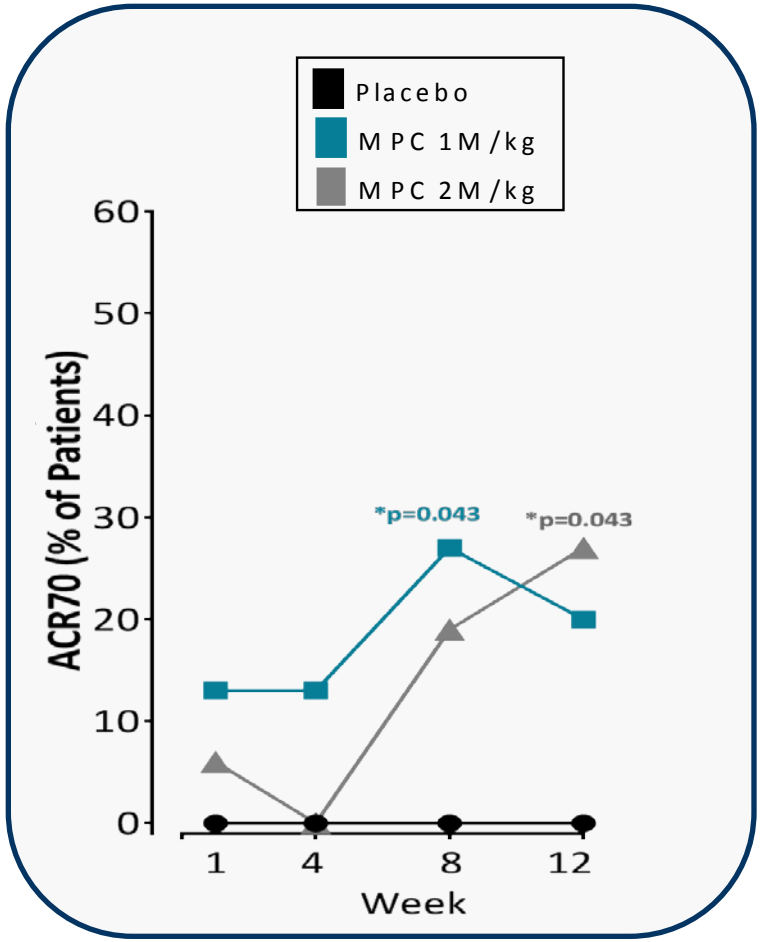
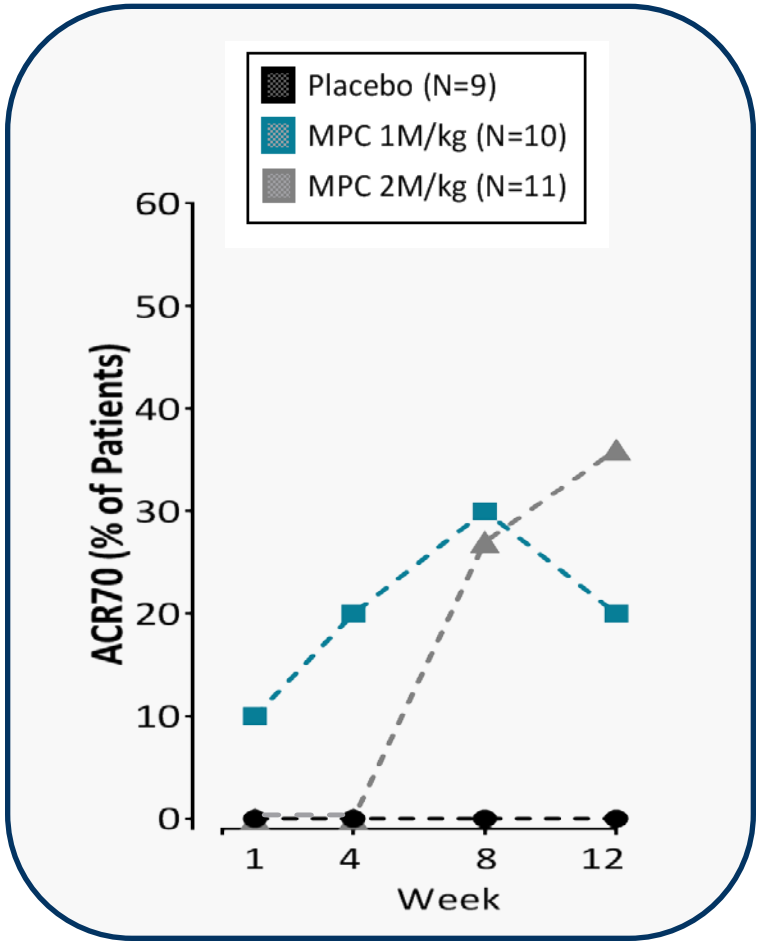
RA001: ACR70 Response (%) over 12 Weeks

All Subjects and Subgroup of 1-2 Prior Biologics[1,2]

All Subjects



1-2 Prior Biologics



NOTE: 1) Values are observed n/N (%) at each time point
2) *P values vs. Placebo computed using Fisher exact test

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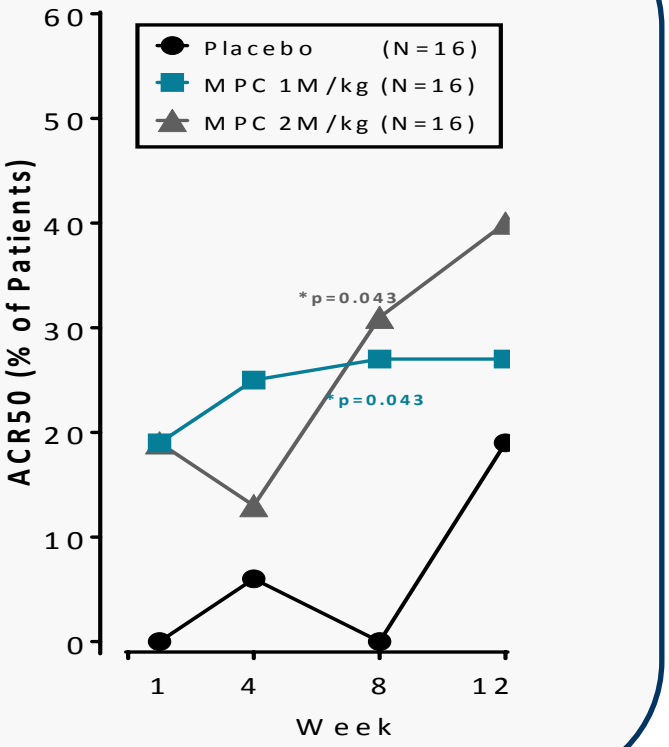
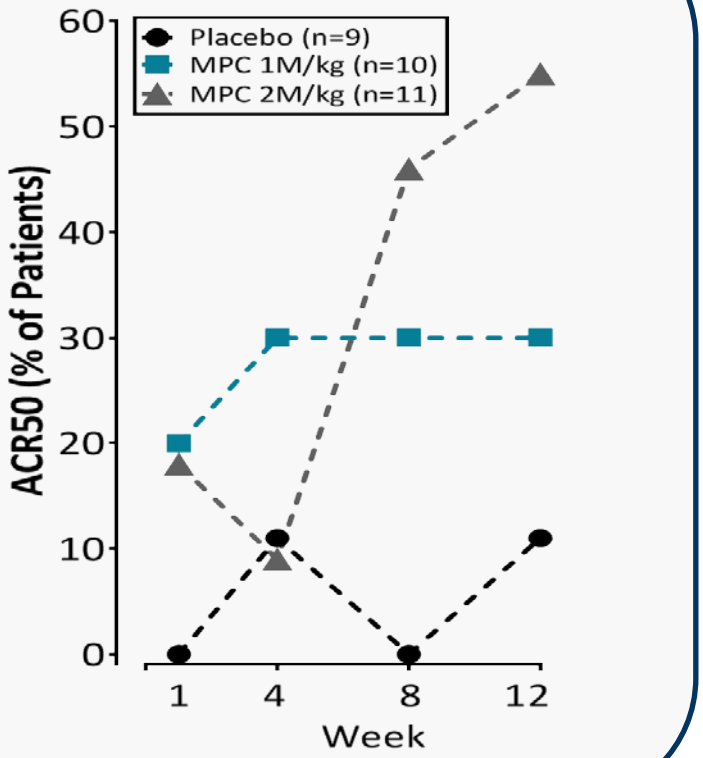
RA001: ACR50 Response (%) over 12 Weeks

All Subjects and Subgroup of 1-2 Prior Biologics[1,2]

All Subjects



1-2 Prior Biologics



NOTE: 1) Values are observed n/N (%) at each time point
2) *P values vs. Placebo computed using Fisher exact test

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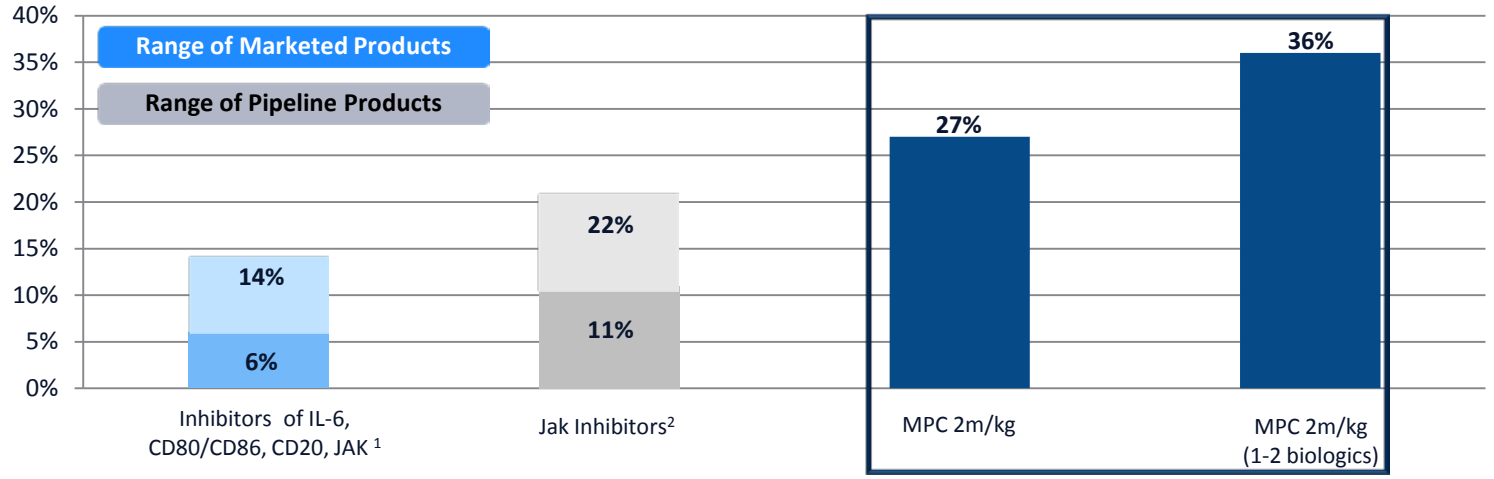
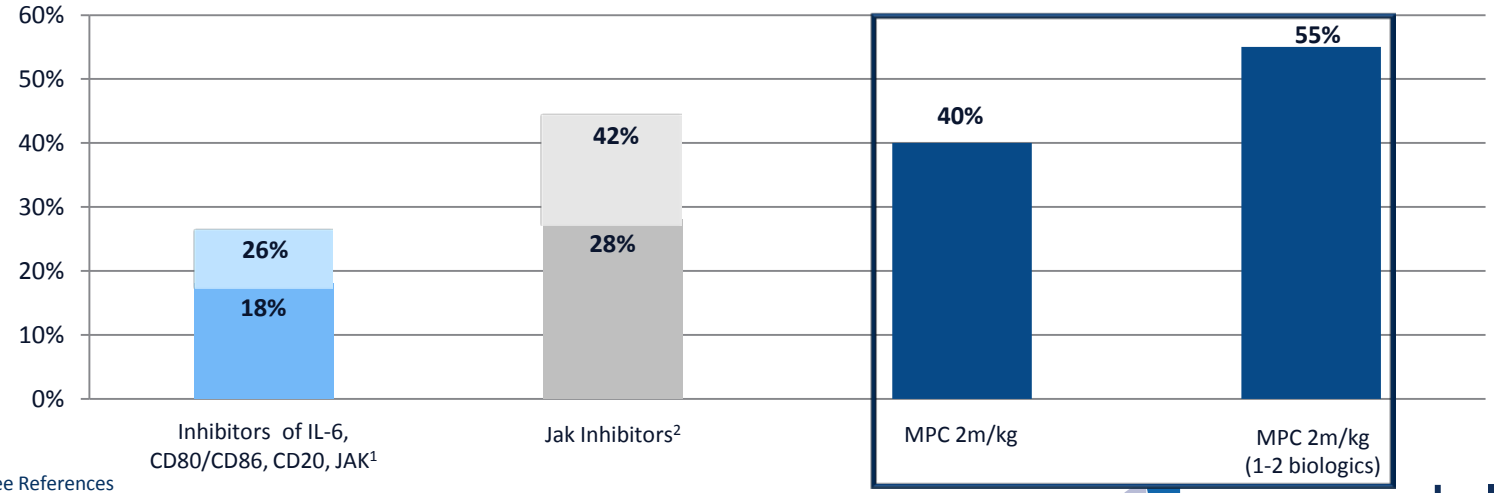
One Dose of MPC-300-IV Provides Compelling Efficacy at 12 weeks in the Biologic Refractory Population*

ACR70 @ 3 Months



ACR50 @ 3 Months



*Source: See References

[1]Inhibitors of Il-6 /CD80-CD86/CD-20/ JAK; Biologic Refractory Studies: Orencia (BMS) – ATTAIN, Rituxan (Roche) – REFLEX, Actemra /8mg/kg (Roche)- RADIATE, Xeljanz /5mg bid (Phase III)

[2] Jak Inhibitors Biologic Refractory Studies: baricitinib/4mg (Eli Lilly/Incyte) – RA – BEACON, ABT-494 /12mg (AbbVie) – Phase IIB

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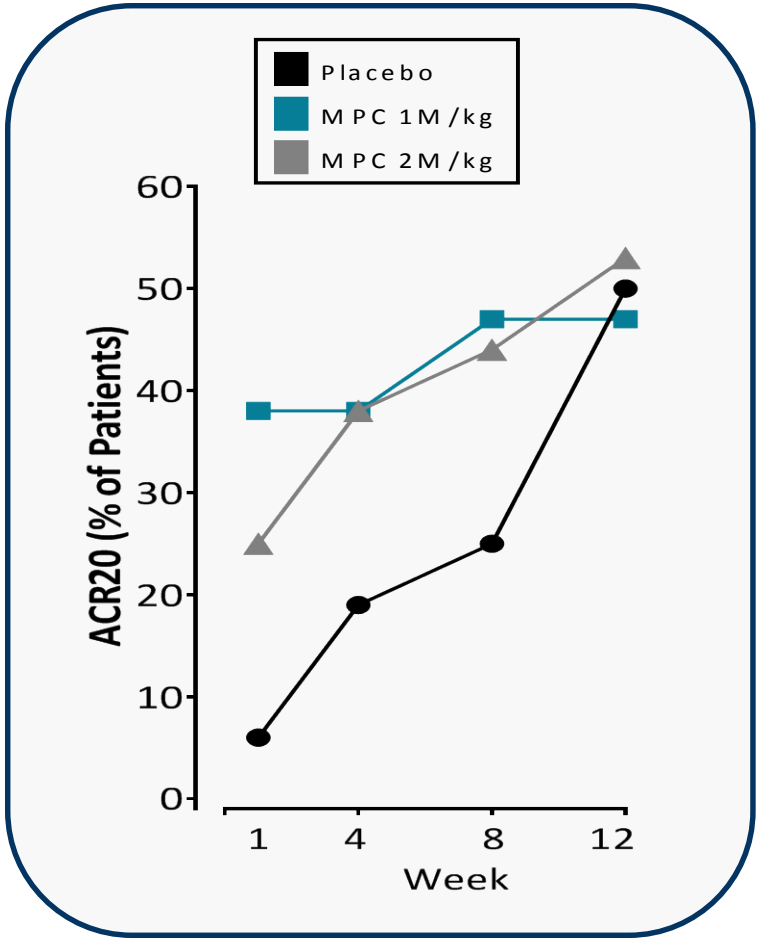
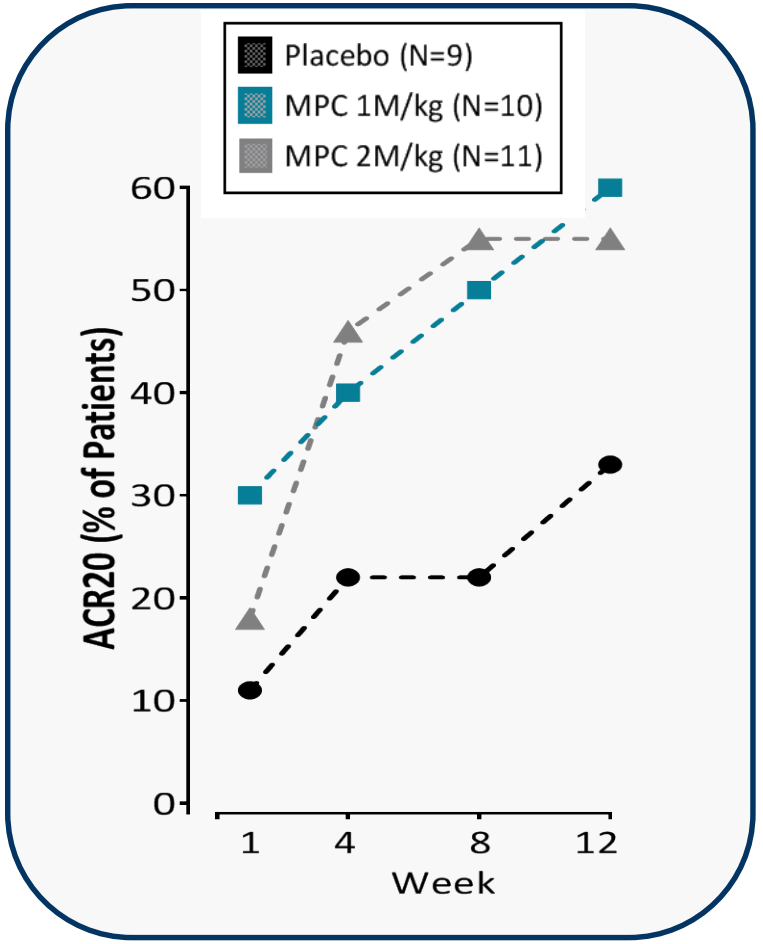
RA001: ACR20 Response (%) over 12 Weeks

All Subjects and Subgroup of 1-2 Prior Biologics[1,2]

All Subjects



1-2 Prior Biologics



NOTE: 1) Values are observed n/N (%) at each time point
2) *P values vs. Placebo computed using Fisher exact test

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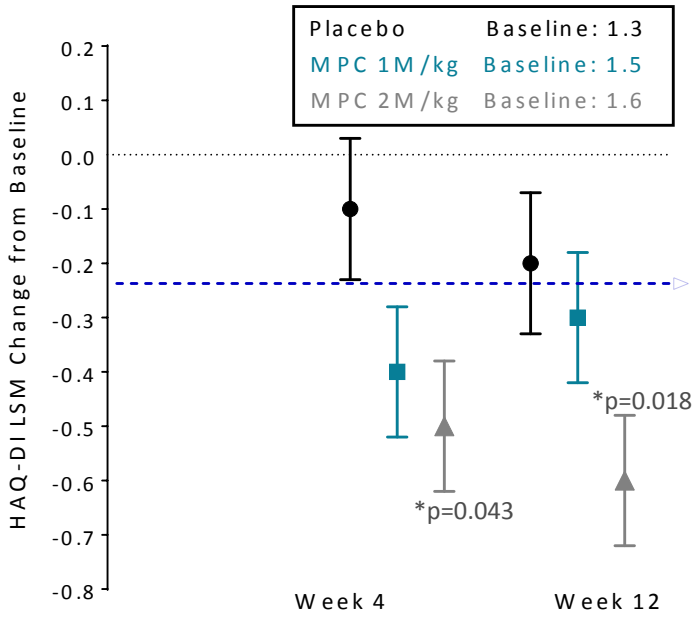
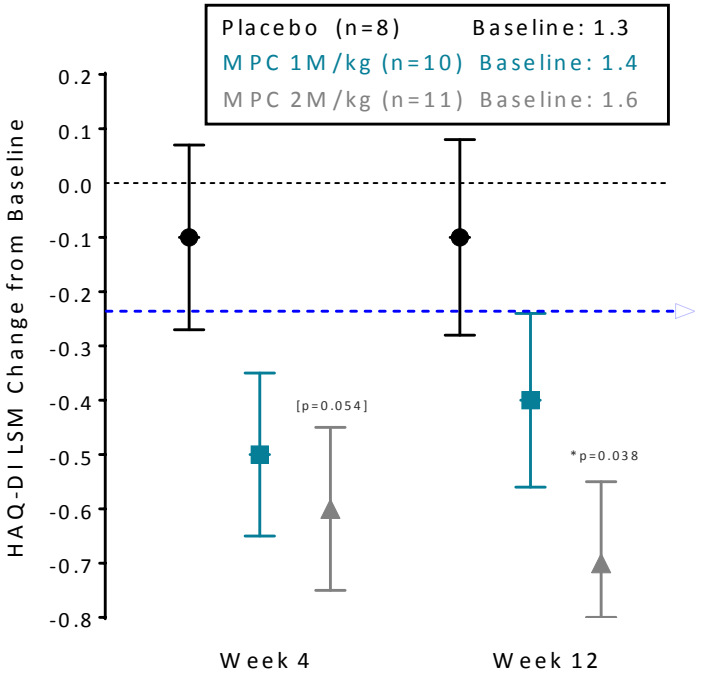
Health Assessment Questionnaire – Disability Index (HAQ-DI)
Least Squares Mean (SE) Change from Baseline at 4 and 12 Weeks
All Subjects and Subgroup of 1-2 Prior Biologics[1,2,3]

All Subjects



Minimal clinically important difference (-0.22)

1-2 Prior Biologics



Significant dose-related improvement in physical function in 2M/kg MPC group vs. placebo

NOTE: 1) LS Mean= Least squares mean change from baseline from ANCOVA
2) HAQ-DI range is 0 to 3 (higher is worse)
3) *P value vs. Placebo from ANCOVA model using treatment as factor and baseline value as covariate

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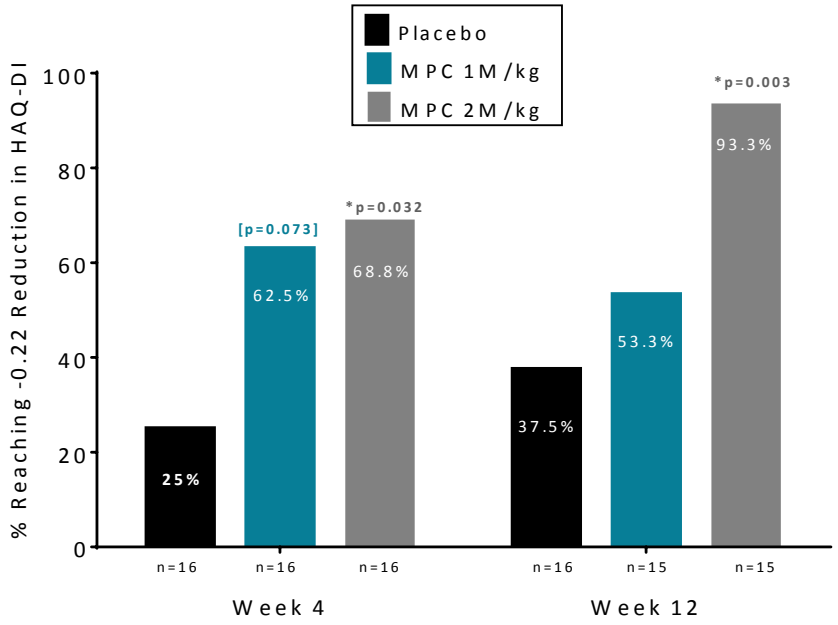
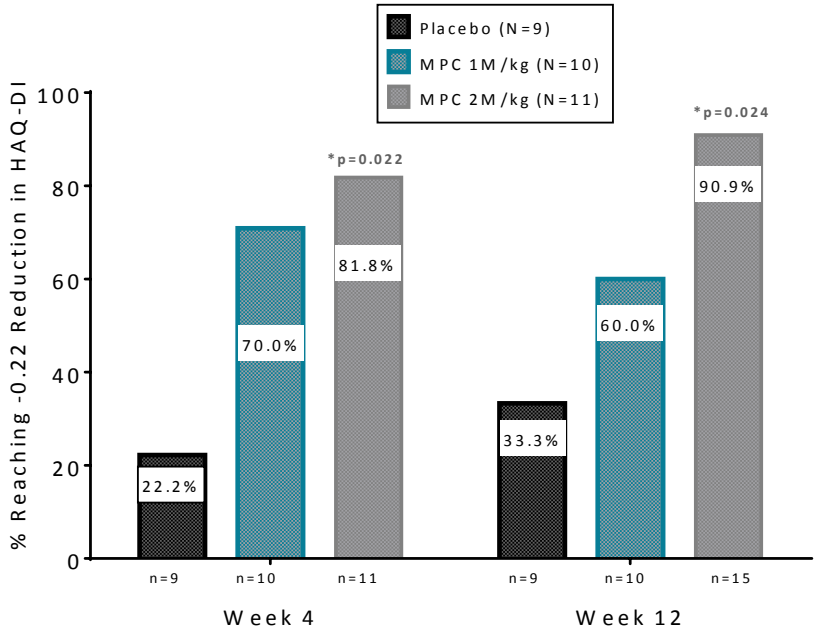
Health Assessment Questionnaire – Disability Index (HAQ-DI)
Percent that reached minimal clinically important reduction of -0.22 at 4 and 12 weeks
All Subjects and Subgroup of 1-2 Prior Biologics[1]

All Subjects



1-2 Prior Biologics



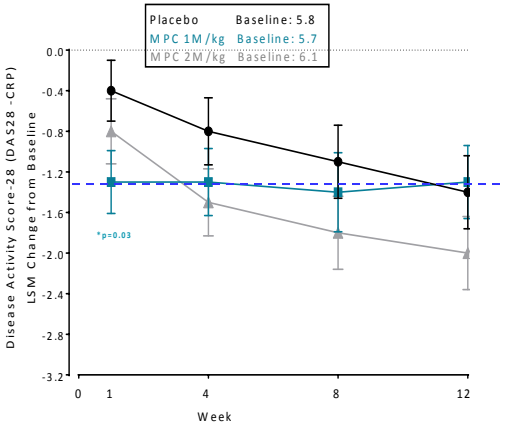
Significantly more MPC patients achieved clinically important improvement in physical function

NOTE: 1) *P values vs. Placebo computed using Fisher exact test (observed values)

Disease Activity Score-28 –CRP (DAS28-CRP) at Week 12
LS mean change from baseline and proportion of patients that achieved low disease activity state (defined as DAS28 ≤3.2)
All Subjects and Subgroup of 1-2 Prior Biologics

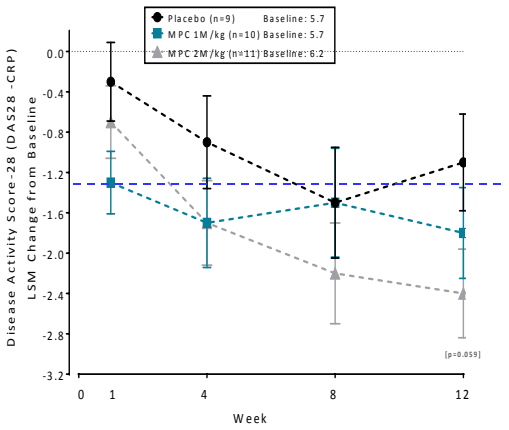
Least Squares Mean Change from Baseline

All Subjects



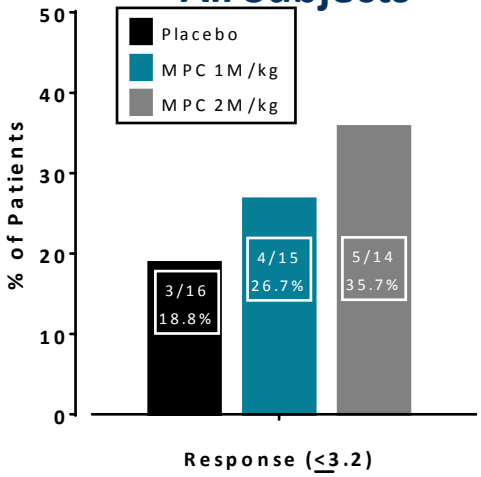
DAS28 change ≤ -1.2*

1-2 Prior Biologics

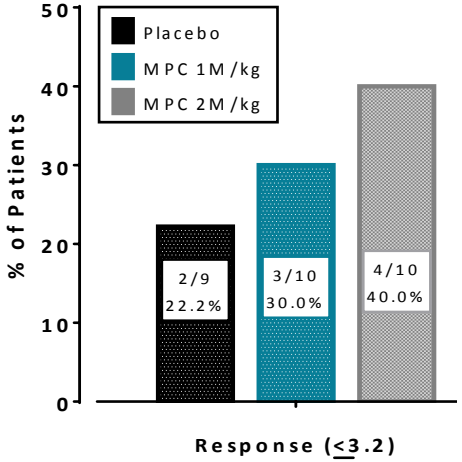


Response: ≤3.2

All Subjects



1-2 Prior Biologics



* Clinically relevant improvement ≤-1.2 Ann Rheum Dis 2009;68:954–60

MPC-300-IV: Conclusions

- The biologic refractory rheumatoid arthritis (RA) population accounts for approximately one-third of all RA patients who have received anti-TNF or other biologic agents, is the hardest to treat, and requires new therapies that are both effective and safe, without the risk of serious infections or malignancies
- Intravenous infusions of allogeneic Mesenchymal Precursor Cells (MPCs) were well tolerated in biologic refractory RA patients and were without serious adverse events over 12 weeks
- A single intravenous MPC infusion in biologic refractory RA patients resulted in dose-related improvements in clinical symptoms, function, and disease activity, with the 2 million MPCs/kg dose providing the greatest benefit
- Importantly, ACR70, the most meaningful measure of clinical improvement, was achieved by significantly more of the high dose MPC-treated than placebo-treated patients
- In patients who had previously received 1-2 biologics, a single infusion of 2 million MPC/kg resulted in 55% and 36% ACR50 and ACR70 responses, respectively, compared with 11% and 0% of placebo treated patients, and in 91% of patients achieving the minimum clinically important improvement in physical function, defined as a reduction of at least -0.22 in the HAQ-DI, compared with 33% placebo treated patients
- The safety and efficacy results of this trial provide support for the potential of Mesoblast's allogeneic MPCs to be positioned as first-line treatment option in RA patients who have previously received a prior anti-TNF or other biologic agent

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References

Abatacept (Orencia[R]) Prescribing Information

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