



79th



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Amorphous calcium phosphate stimulates osteogenesis from bone marrow mesenchymal stromal cells

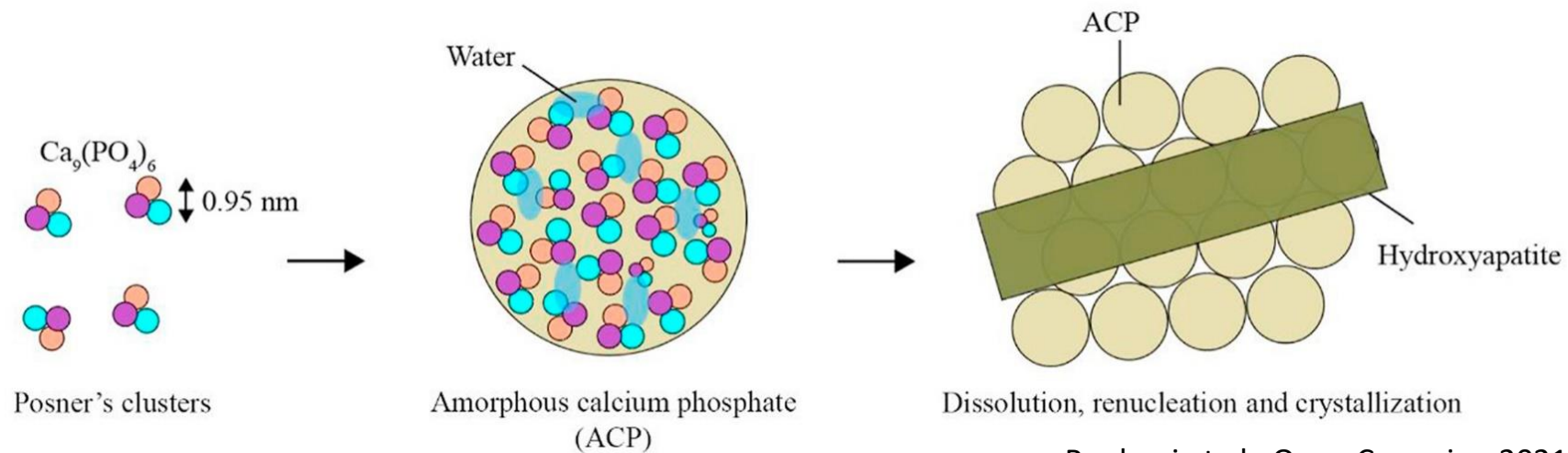
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The Aim: to observe the biocompatibility and assess osteoinductivity from mesenchymal stromal cell seeded amorphous calcium phosphate coatings

- **Background.** The medical need for bone reconstruction is growing. Amorphous calcium phosphate (ACP) is the first bone mineral phase to form in bone, and so provides the basis for investigation in this study.

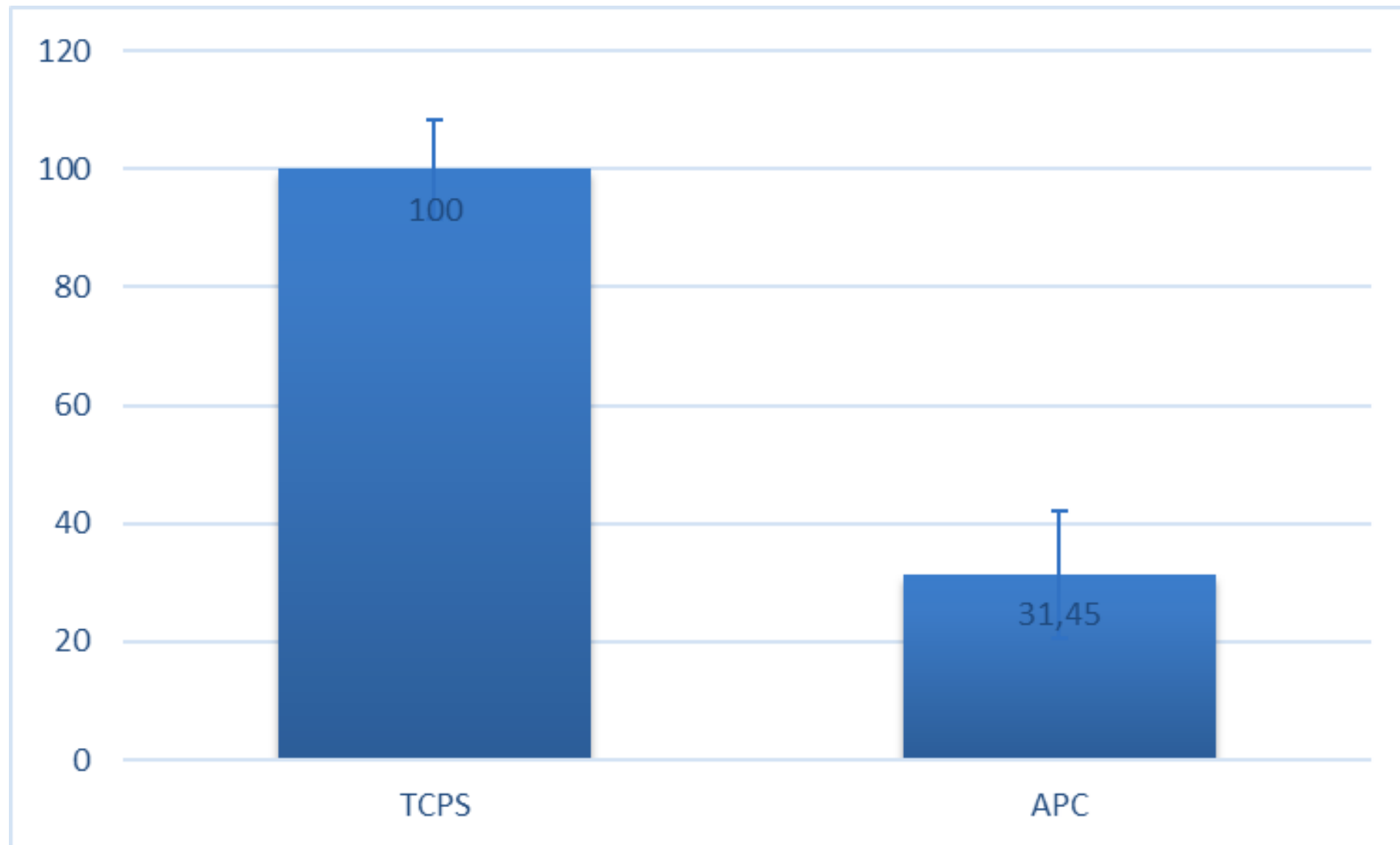


Roohani et al., Open Ceramics, 2021

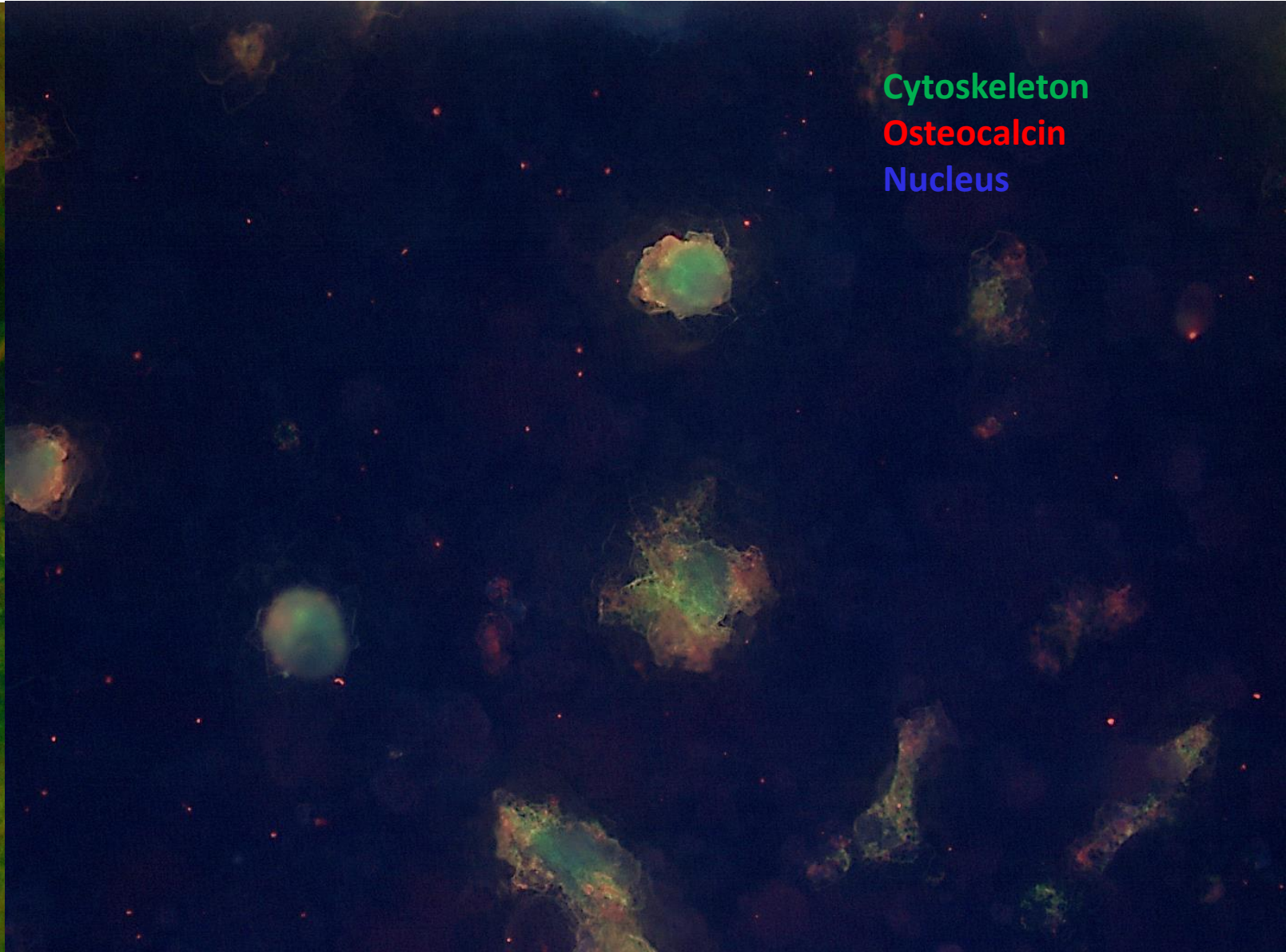
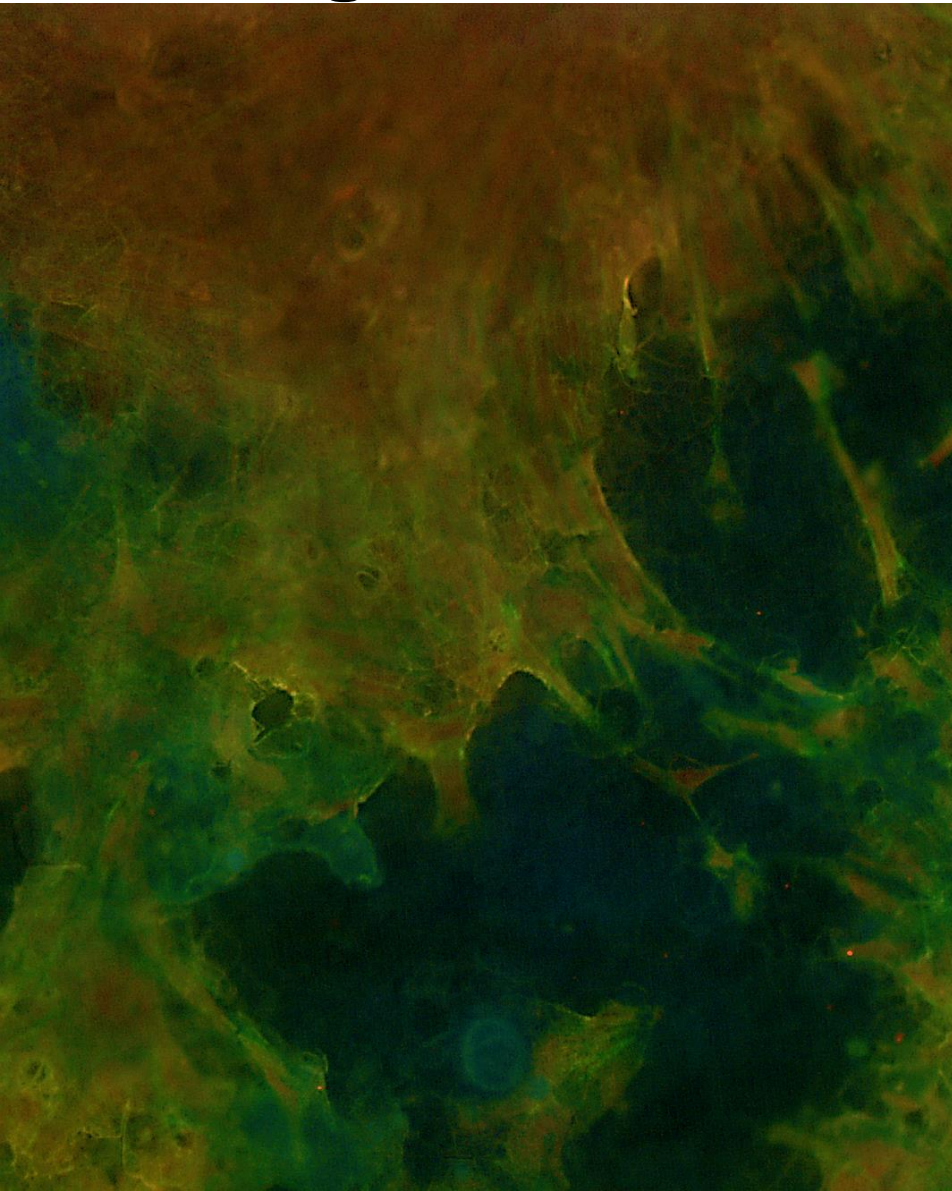
- **Methods:**

- **ACP** flame sprayed titanium coatings were **seeded with bone marrow MSCs**;
- **Viability** was assessed with a colorimetric CCK-8 assay;
- **Osteogenesis** was induced by osteodifferentiation medium for 3 weeks;
- **Osteocalcin** expression was evaluated after 3 weeks by immunofluorescence analysis.

Results



Osteogenesis from MSCs seeded on ACP



Cytoskeleton
Osteocalcin
Nucleus

Conclusions

- MSC viability on ACP surface was 31% comparing to TCPS
- MSCs displayed spheroid-like structures on ACP heat sprayed titanium coatings
- Osteocalcin expression increased following MSC propagation in osteoinduction medium on ACP surface
- Viability test is a feasible method for fast evaluation of the ACP biocompatibility

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