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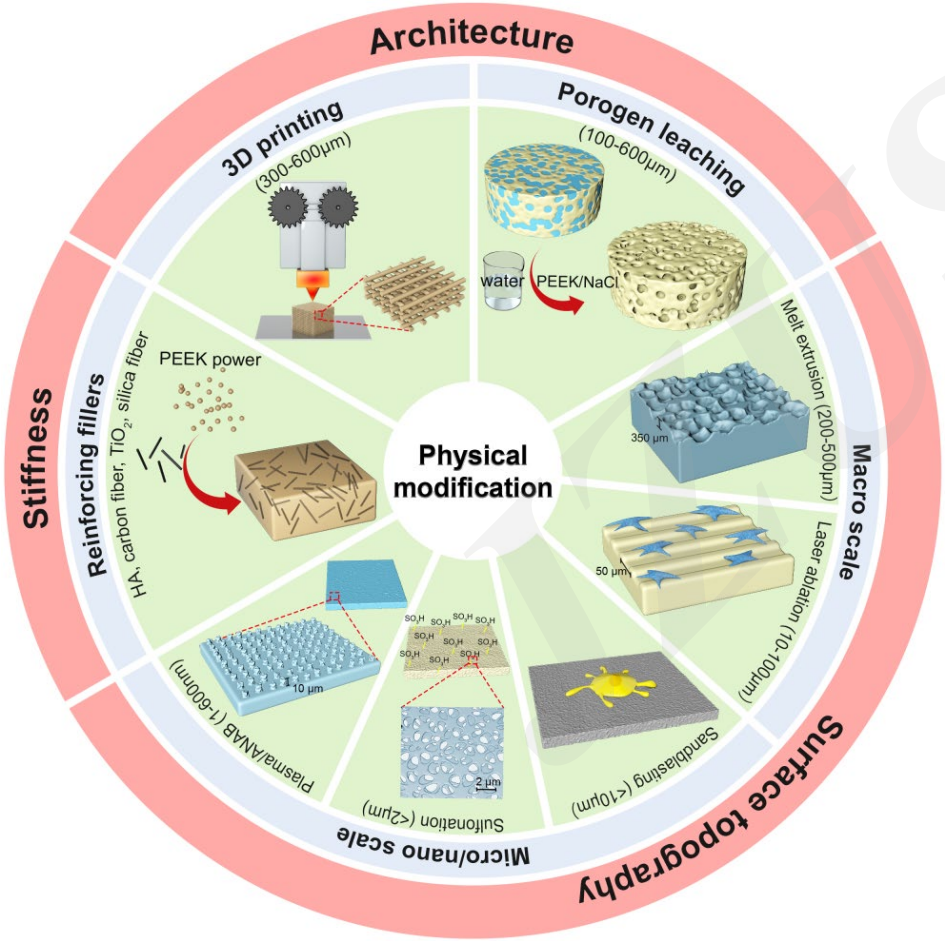
Modification of PEEK physical features to improve osteointegration

Key words: PEEK; Surface topography; Architecture; Stiffness; Bone integration

Research Summary

This review focus on the multiple strategies for the physical modification of PEEK implants through adjusting their architecture, surface morphology, and stiffness.



- **Architecture** modifications：
  3D printing and porogen leaching
- **Surface topography** modifications:
  - Macro-scale methods
    melt extrusion technique and laser ablation
  - Micro/nano methods
    sandblasting, sulfonation, plasma treatment
    and accelerated neutral atom beam
- **Stiffness** modifications:
  by incorporating reinforcing fillers

Innovation points

- **Introduction** of multiple strategies for the physical modification of PEEK implants through adjusting their architecture, surface morphology, and stiffness

Table 1 | Characteristics and biological properties of plasma-treated PEEK.

- **Summary** of their effects on the physical structure, mechanical properties and biological activity of PEEK

- **Emphasizing** the importance of soft tissue integration to improve long term stability

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