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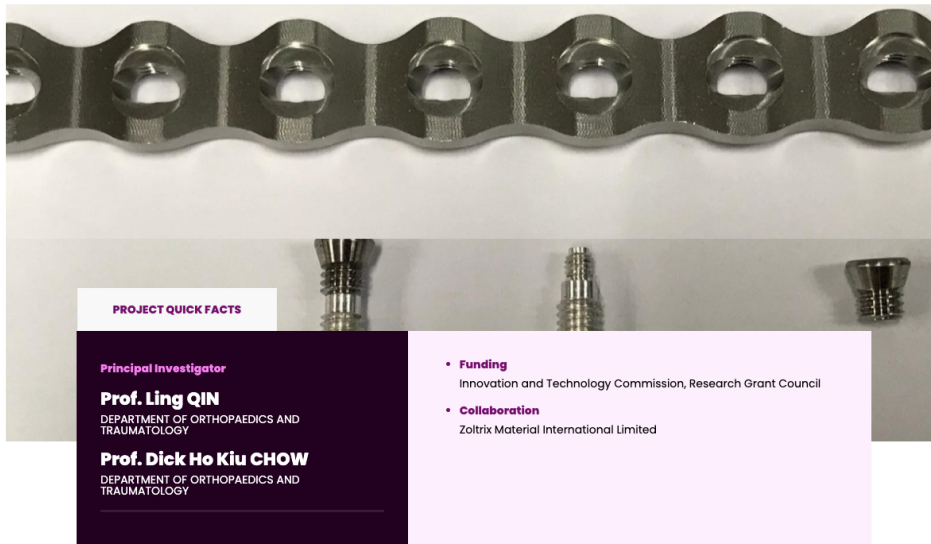
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# Novel Magnesium-based Implants for Fracture Healing and Steroid-induced Osteonecrosis

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CUHK research team has developed a novel hybrid system of Magnesium-containing implant for fracture fixation to enhance the healing quality by incorporating biodegradable Magnesium (Mg) into the conventional implants. Titanium-Magnesium plate-screw hybrid fixation system has been produced and tested in small animal model, our result indicates that the system is a promising solution for clinical applications, especially for elderly patients with osteoporotic fracture. In this project, we have further modified the design of hybrid fixation system.

Locking plate and screws are introduced in current project, instead of dynamic compression plate to maximize the osteogenic potential of Mg ions during degradation of Mg-based screws, via a novel periosteum-dependent mechanism, to promote bone formation and facilitates fracture healing. Surface modifications will be performed on the surface of Titanium (Ti) implants to have adequate mechanical properties for human applications.

## Uniqueness and Competitive Advantages

- Sufficient and desired mechanical strength for fracture fixation
- Enhancement of fracture healing
- Modifications based on commercially available implants
- Validated in large animals



The screw with new design did not break off, compared to previous design, after the screws were completely inserted into the tibia of goat





The fabricated locking plate and hybrid screw

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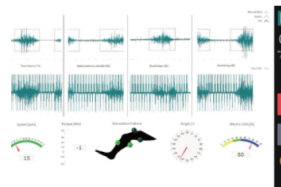
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