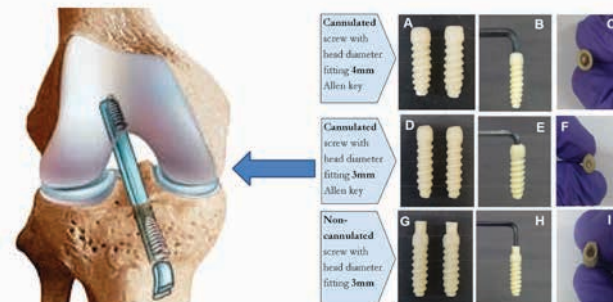


## Bioresorbable Screw for ACL Repair



**Problem Statement:** Bioabsorbable or metal screws are used for bone grafting. Although both have similar fixation strengths, bioabsorbable screws eliminate the need for removal and easier postoperative imaging. But bioabsorbables increase inflammatory response, risk of screw breakage, incomplete screw absorption or tunnel widening. In addition, inappropriate grafting technology might lead to bone loss; thus, choosing an appropriate product is crucial. However, currently, the available products have many shortcomings. For example, although several non-absorbable and resorbable polymeric devices are available in the market, they are not radiolucent, which hinders the post-surgical follow-up of the repaired part, and many don't promote bone regeneration. This research team's innovative design overcomes these drawbacks.

**Uniqueness of the Solution:** Bioresorbable screws with an advanced

biomaterial technology platform is a one-stop solution for developing a wide variety of resorbable bone-soft tissue fixation devices like bone screws, plates, suture anchors, etc. The product is cost-effective and matches the required stress and mechanical demands of specific target human tissue. These screws comprise bioactivity and tool kit compatible parameters, are entirely resorbable, have far superior imaging compatibility, and have tunable mechanical strength and prevent infection.

**Current Status of Technology:** The technology is evaluated preclinically and found to be safe. It is currently at TRL-5 as per BIRAC medical device guidelines.

**Societal Impact:** These bioresorbable screws significantly reduce the cost per screw as they use cheaper and readily available raw materials and in-house development and manufacturing of bioresorbable bone-soft tissue fixation devices. The novel screws will fulfil the

unmet socio-economical medical need of economically weak end-users. These resorbable screws help surgeons who want to fuse bone faster and provide better post-surgical care by growing the bone and minimising the risk of infection.

**Patent(s):** Filed

**Relevant Industries:** Healthcare, Manufacturing, Medical Devices.

**Faculty:** Prof. Jayesh Bellare, Chemical Engineering and Prof. Rohit Srivastava, Biosciences & Bioengineering.