**UQ Summer or Winter Research Project Description**

Please use this template to create a description of each research project, eligibility requirements and expected deliverables. Project details can then be uploaded to each faculty, school, institute, and centre webpage prior to the launch of the program.

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| **Project title:** | **3D printing of functional bioceramics for bone regeneration** |
| **Project duration:** | 6 weeks |
| **Description:** | Craniofacial bone defects, caused by infections, injuries or congenial deformity, predispose functional and aesthetic complications. For bone defects repair, engineered bone scaffolds are receiving increasing attention compared to conventional bone grafts, due to their large supply and no disease transmission. Among them, inorganic bioceramics containing calcium, silica and phosphate are of special interest due to their intrinsic osteoconductive property which instructs its surrounding environment to form bone. However, traditional solid bioceramics are less satisfied with their low bioactivities. In addition, the conventional forms of powders or granules of bioceramics are not good for the migration of bone cells and hard to fill the gaps of complicated craniofacial bone defects.  3D printing technique provide the ability to fabricate 3D porous scaffolds with designed interconnected macroporous network, which offer more advantages than conventional powders or granules. It would be ideal to fabricate optimized biomaterials into a 3D porous scaffold which allows bone cell migration, nutrient delivery, vascularization and new bone ingrowth. In this project, 3D printed bone scaffolds will be fabricated with designed structures and better bone regeneration ability for customized bone defect repair and regeneration. |
| **Expected outcomes and deliverables:** | Student will gain skills in 3D bioprintting, cell biology and data collection. They will be encouraged to produce a report and oral presentation at the end of their project. |
| **Suitable for:** | This project is open to applications from master students enrolled at UQ with a background in biotechnology. |
| **Primary Supervisor:** | Professor Adam Ye/Dr. Chun Xu |
| **Further info:** | Please contact Professor Adam Ye at a.ye@uq.edu.au or +61 7 336 58078 for further information before you apply for this position. |