

HOW THE BIOMATERIAL IS MADE



1 Collagen extraction

- Remove impurities from bullfrog skin
- The bullfrog skin is blended to form a thick collagenous paste that is diluted with water
- Collagen is extracted from this mix



2 HA extraction

- Harvest HA from fish scales through a purification process that requires high heat to remove the organic matter
- It is then crushed into fine powder and air-dried



Biomaterial made from frog skin and fish scales

OVERVIEW

• Collagen and hydroxyapatite (HA) are two main components found in bones.

• These two components give the biomaterial a **structure, composition, and the ability to promote cell attachment** that are like the bone.

This approach's...

• Commercial viability

The method achieved the highest ever reported yield of collagen obtained from frog skin:

Around
70%

• Sustainability

Most sources of collagen are derived from meat. Against the backdrop of climate change and the circular economy, using bullfrog skin as a source of collagen is **more sustainable**.

• Aid in aquaculture waste reduction

Making use of discarded frog skin and fish scales helps cut down the waste from two of Singapore's largest aquaculture waste side streams.



3 Chemical reaction

Chemically react the extracted collagen and HA together for 24 hours at 4 deg C



4 Freeze drying

Pour reaction mix into a mould and freeze dry to form porous biomaterial

