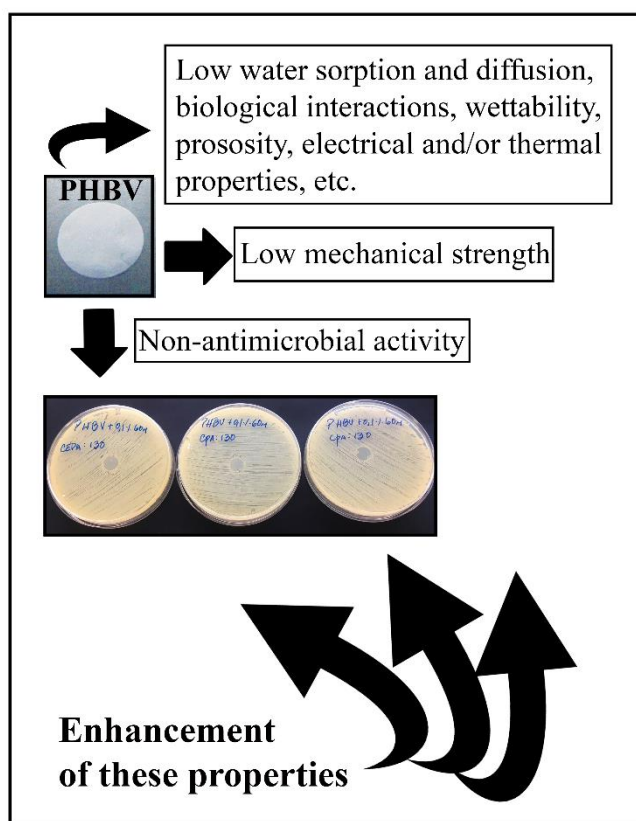


Enhancement of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)'s properties for advanced industrial applications

Ariagna Laritza-Rivera-Briso (aribri@mail.ucv.es), Belén Frígols-Garrido (belen.frigols@ucv.es), Miguel Martí-Jiménez (miguel.marti@ucv.es) & Ángel Serrano-Aroca (angel.serrano@ucv.es)

Bioengineering & Cellular Therapy Group. Facultad de Veterinaria y Ciencias Experimentales. Universidad Católica de Valencia San Vicente Mártir, C/Guillem de Castro 94, 46001 Valencia, Spain

Graphical Abstract



Abstract.

Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBHV) is a very promising biodegradable polymer from the family of Polyhydroxyalkanoates (PHAs) with many potential applications in many important industrial fields such as biodegradable packaging, synthetic prosthesis, therapeutic delivery, wound dressing, 3D tissue scaffolds for tissue engineering, etc. due to their excellent biocompatibility, non-toxicity, and suitable large-scale industrial production. However, many of its potential uses required for these applications often are hindered by their low mechanical strength, non-antimicrobial activity, low water sorption and diffusion, biological interactions, porosity, electrical and/or thermal properties, among others. Thus, new advanced PHBHV-based composite materials have been developed as multicomponent systems in the form of composite or nanocomposite materials, which are expected to exhibit superior properties to increase the potential uses of these materials. Even though the great advances achieved so far, much research has to be conducted still in order to find new strategies to fabricate novel materials able to overcome many of these problems.

<https://www.ucv.es/investigacion/publicaciones/catalogo-de-revistas/revista-nerreis> (NEREIS N°10)

References

- Van Blitterswijk C, De Boer J. Tissue engineering. Academic Press; 2014.
- Ratner BD *et al.*, Biomaterials Science: An Introduction to Materials in Medicine. Canada: Academic Press; 2012.
- Bugnicourt E. Polyhydroxyalkanoate (PHA): Review of synthesis, characteristics, processing and potential applications in packaging. *Express Polymer Letters*, 8, 791-808 (2014).
- Han J *et al.*, Biodegradation and biocompatibility of haloarchaea-produced poly(3-hydroxybutyrate-co-3-hydroxyvalerate) copolymers, *Biomaterials* 139, 172e186 (2017).