

# Functionalized PVC with biomolecules

University of Chile has generated a new material able to reduce the use of plasticizers in PVC, such as DEHP which has been described as highly toxic and harmful for human health.

## THE CHALLENGE

DEHP is the most utilized plasticizer in medical devices, such as blood bags, IV catheters, tubes, etc., since it provides the necessary flexibility to PVC. However, due to the high toxicity of this compound to human health, alternatives have been studied to reduce the use of DEHP in PVC unsuccessfully. This invention represents an improvement to the existing materials by showing a higher flexibility and blood compatibility. Also, since this PVC is functionalized to amino acids, the risks to human health due to toxicity would be reduced.

## THE TECHNOLOGY

**Polyvinylchloride (PVC) chemically modified through functionalization with biomolecules** (hydrophilic amino acids) that would allow obtaining flexible polymeric films, compatible with blood, which can be used in medical devices, such as blood bags.

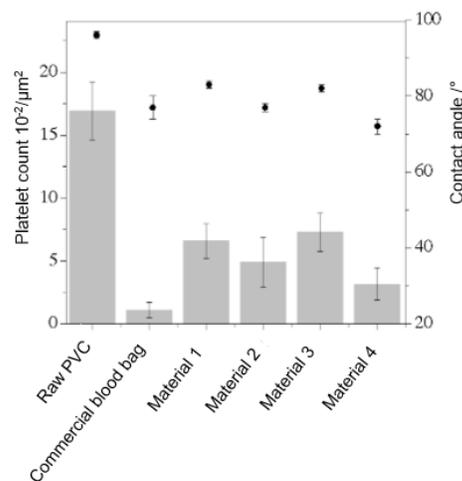
This functionalized PVC described here has been tested at laboratory scale. The flexibility of this new PVC was tested through traction assays and was proven to be higher than PVC, and compatibility with blood was tested through platelet adhesion assays (Fig.1) showing that this material was more compatible with blood compared to PVC alone.

When merging PVC with amino acids, as in this innovation:

- There is no diffusion of molecules.
- The modification is not superficial, which implies that it is maintained over time.
- This merger is cheaper than current solutions with DEHP.

## STAGE OF DEVELOPMENT

- **Laboratory tests.**



**Figure 1. Adhered platelets count per  $\mu\text{m}^2$  of surface (bars) and contact angle (circles) for Raw PVC, commercial blood bag and the new materials.** The results confirm that the functionalization of PVC with biomolecules results in a polymer that minimizes the thrombological behavior of the blood and turns out to be more hemocompatible

## COMPETITIVE ADVANTAGES

- Flexible polymeric films, compatible with blood.
- This functionalized PVC with amino acids, decreases the risks to human health due to toxicity.
- This merger is cheaper than current solutions with DEHP
- The modification is not superficial, which implies that it is maintained over time.

## APPLICATIONS

- New material for medical devices

## OPPORTUNITY

University of Chile is searching for industry partners for **out-licensing and/or collaborating/contract research.**

## INTELLECTUAL PROPERTY/REFERENCES

- Patent application WO/2018/083623; CL 201602771; US 16/346,830; EPO 17866448.8