

# Smart Separations

**Dr Hugo Macedo**

Arriving in the UK as an Erasmus student 13 years ago, Dr Hugo Macedo started his own company, Smart Separations Ltd, initially working out of his kitchen, garage and even his uncle's shed. The company now has its own office and laboratory space in London and 14 staff on its payroll, with European Union (EU) funding playing a vital role in its development.

Company: [Smart Separations Ltd](#)

CEO: [Dr Hugo Macedo](#)

Funding: [Horizon 2020 SME Instrument Phase 1 & 2](#)



Dr Hugo Macedo, CEO of Smart Separations Ltd (right)

Dr Hugo Macedo was born in Portugal, studying Chemical Engineering at the New University of Lisbon. He moved to the UK initially under the Erasmus programme in 2005, an EU student exchange scheme that enables students from countries within the EU to undertake placements in other EU countries. He was then invited to stay on for a PhD position at Imperial College London, to develop a method to produce human blood in the lab (which he did!). He started his company, Smart Separations Ltd, five years ago, initially working out of his kitchen.

The company has patented an innovative technology that allows them to produce ceramic filters with self-assembled, controllable pores of a variety of sizes.

**"Microfiltration is a poorly explored field," explains Hugo.** "I know this because my own background is in cell

separations in regenerative medicine. **The technologies that are there are either very expensive or very inefficient.** We came up with a way to create pores that are conical and self-assembled in the manufacturing process. We then use the tech – where our IP [intellectual property] lies – to cut slices of these membranes and depending on where we cut the cone, we have different pore sizes. This is a game changer as we do not need to go back to the drawing board and create a new pore size each time the customer needs a new pore size – we can cut whatever pore size the customer needs."

The microfilters Hugo's company can produce have a variety of applications, from air filtration – removing pollen, dust or other allergens in an antibacterial surface – to antibody production in the pharmaceutical industry. Hugo's filters are also reusable and recyclable, with a longer shelf life and reduced environmental footprint.

## Building a business and the importance of international mentoring

Hugo founded Smart Separations Ltd on the back of an InnovateUK SMART award, and this funding enabled him to apply for the EU's SME Instrument schemes, designed to 'boost fast company growth and market-creating innovation'. Their first grant under this scheme was a €50,000 Phase 1 grant that

allowed Hugo's team to employ a consultant to draw up a business plan. **"It was vital," says Hugo. "It wasn't just the business plan, it's everything that comes with it: all the contacts we've had and the changing approach to our business.**

**"It provided access to the EU mentorship programme.** We had access to, in this case, an Austrian mentor, and he helped us immensely by opening up the door to Austria, as well as other countries, where we could tap into different expertise. I think that is something we are slowly forgetting in the UK. Since I started in 2013 I've had the chance to be part of the Growth Accelerator programme that InnovateUK had but somewhere down the line they killed off that programme. Even though in the past we used to have that support from mentors, now we don't have it anymore, we just have the grant. This is something the SME Instrument does bring."

### Scaling up and going to market

The Phase 1 support also gave Hugo and Smart Separations Ltd a strong position from which to apply for further funding, and they successfully secured an InnovateUK Industrial Strategy Challenge Fund grant and Phase 2 funding, of €2.8 million, from the EU's SME Instrument programme. **"The SME Phase 2 is a game changer for us as it brings a visible amount of money for us to use towards scale-up of that technology initially conceptualised in my kitchen.** We are at that turning point from being an R&D [research and development] company to actual manufacturing. We have just started this grant and it allows us to go on to the next level to manufacture these membranes and bring them to market."

While their products are not yet commercially available, Smart Separations Ltd are working with a significant investor from the air purification industry to develop their technology for market. They also have a collaboration with the University of Surrey and the International Nanotechnology Laboratory in Portugal, researching applications of their work in cancer treatment.

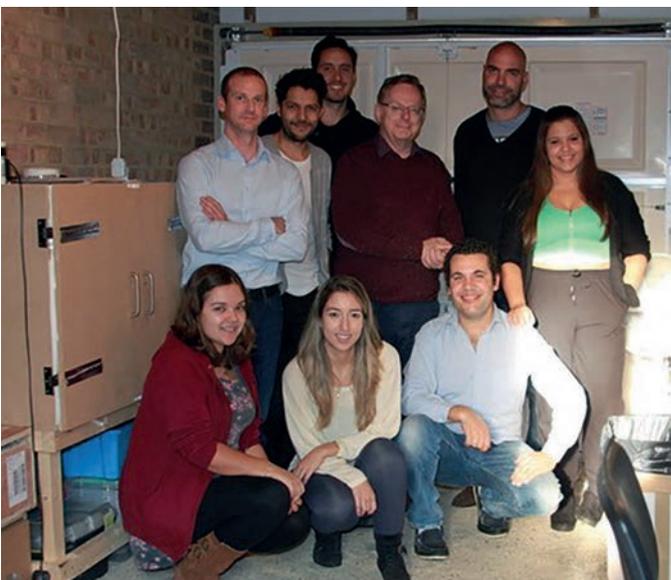
### International exchange

Hugo's team at Smart Separations Ltd is very diverse, with employees from Portugal, Argentina, Greece, Mexico, South Africa and the UK. **Hugo is understandably very passionate about the Erasmus programme and has continued to host Erasmus students at his company.** "We have a big collaboration with the University of Surrey and they have been staying and working there as well as with us. The students we host essentially get a taste of studying in another setting but they also get experience of working in industry. They have a chance to come out of their country, out of their comfort zone and they work hard and apply themselves."

Of the three students Hugo has hosted, one has remained in the UK at Smart Separations Ltd and the others have taken their skills and experience back to their home countries.

EU funding programmes have been essential in enabling Hugo to establish a company that provides a much-needed, innovative solution to a gap in the market, taking his initial kitchen research to a fully commercial manufacturing company in the UK. Put simply: **"Our company would not exist today without them,"** says Hugo.

The team at Smart Separations Ltd



The shed where Hugo's company began

