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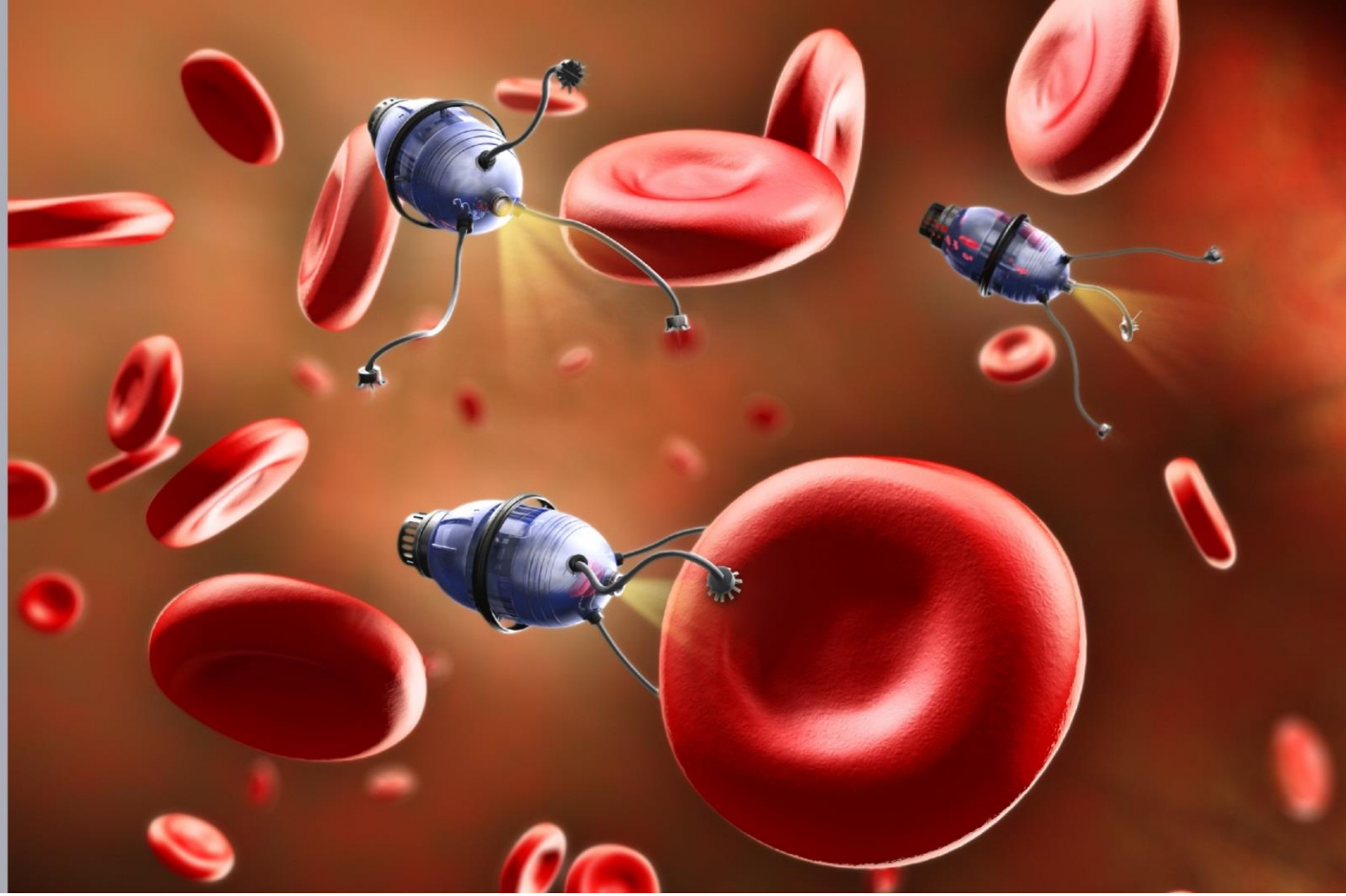

Preparation of paraffinic hydrocarbons (HVO) from natural fats

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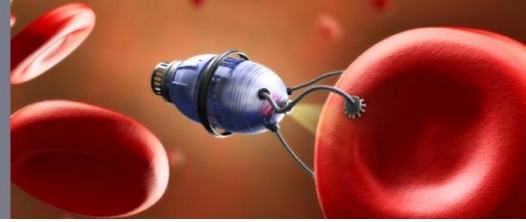
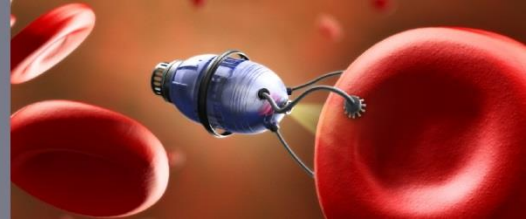


- *Problem: conversion of low quality fats into high quality fuels*

- Climate protecting polices have been creating a growing demand for fuels made of renewable sources
- Currently bioethanol (gasoline additive) and fatty acid methyl esters (FAME, diesel additives) dominate. However:
  - There is no biofuel compatible with jet fuel
  - The upper limit for FAME allowed by carmakers (5-7%) is below the EU 2020 target – 10%
  - There is a need to produce biofuel from waste, non-food materials e.g. waste fats and fatty acids
  - FAME are not fully compatible with diesel
  - FAME have disadvantages e.g. reducing fuel performance and increasing NO_x emissions

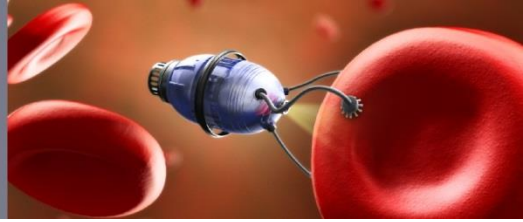
New technologies are needed



The solution: Hydrogenated Vegetable Oil, HVO

1. HVO are hydrocarbons similar to fossil fuels and can be blended in all proportions
2. HVO can be made of low quality fats and fatty acids
3. Jet fuels and gasoline fraction can be made using HVO technology
4. HVO storage properties and fuel performance is favourable when compared with FAME

The HVO market and technology is in its infancy, although the market already comprises 10 % of biodiesel market in Europe and is growing rapidly.

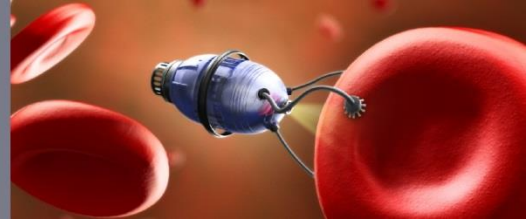


HVO industry overview

Investment in HVO plants is being fuelled by:

- High quality: better than the EN14214 biodiesel standard
- Cheap feedstock: Crude Palm Oil (CPO), palm fatty acid distillate (PFAD) and waste *Animal Fat*
- Reduced dependence on rapeseed oil to meet quality standards (presently biodiesel requires 50%)
- Financial and social reasons: overcapacity, workplaces
- By-products much more valuable than those produced from FAME (low quality glycerine)
- Production using methane capture (35%) coupled to reduced emissions is compliant with incoming regulation (2017)

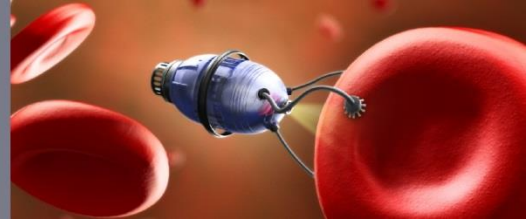
In Europe HVO represents around 10% of the biodiesel market and is going to double within the next 3 - 5 years.



Project competitive position

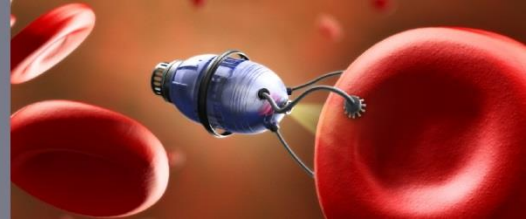
The project method has many advantages over existing technologies

- New cheap and durable catalysts
- Executed under atmospheric pressure: significantly milder conditions
- Continuous process
- Products meet existing fuel specifications without further treatment or blending
- High yield



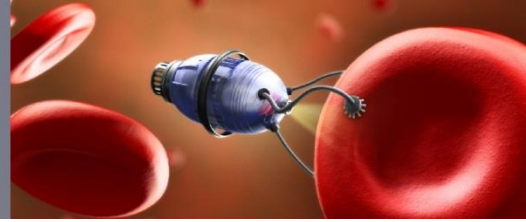
IP position

- Patent applications filed: entering PCT stage
- Favourable FTO position



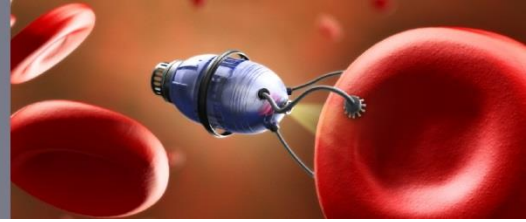
Inventor

- Technology invented by scientist working at the Institute of Industrial Chemistry, Warsaw, Poland



Commercial expectations

- Founders seeking either a licensee of the IP, or
- An investor to finance a start-up company to: (i) verify scalability of the technology, (ii) finance the work plan for industrialization, prior to (iii) seeking interested parties internationally.



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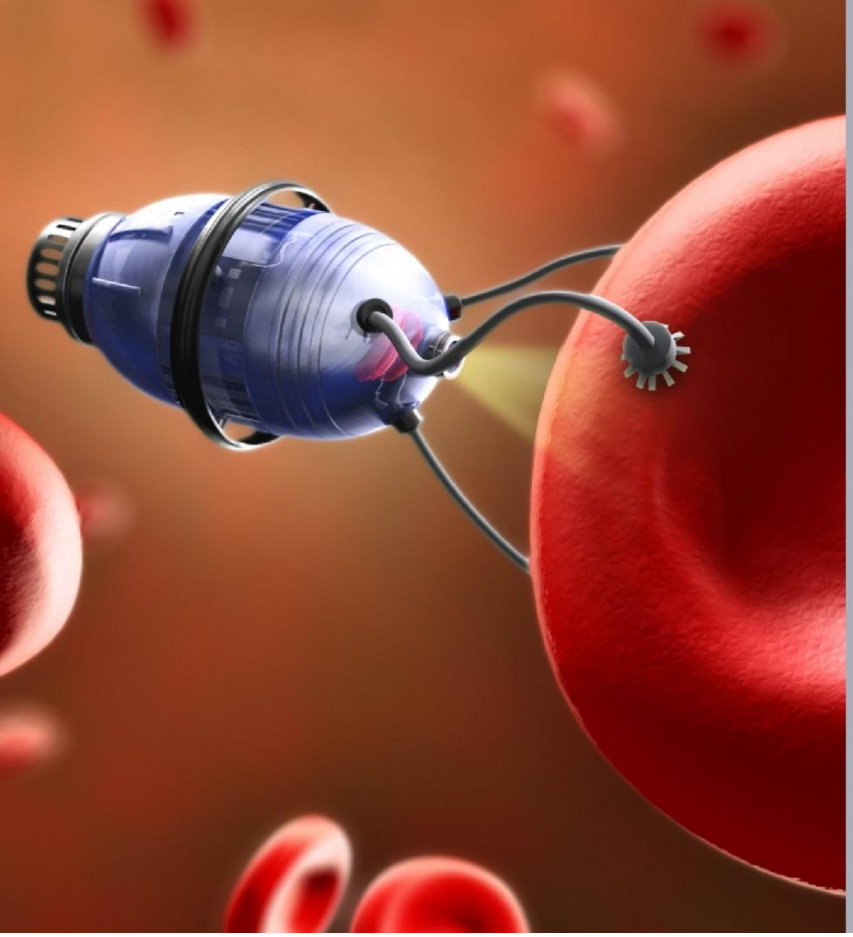

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Thank you

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