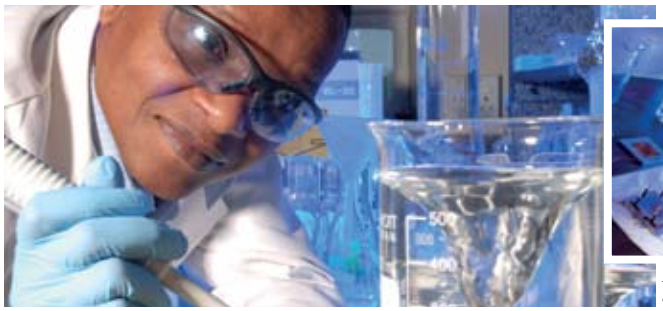
# Science for a greener future



*Biotechnologist Ntsane Moleleki is looking into the use of yeast to produce human therapeutic proteins (Photo: CSIR)*

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*Beverley Damonse, executive director of SAASTA*

*With a* world population heading towards nine billion people, tomorrow's scientists and engineers will face many challenges. Biotechnologists will have to find ways to grow more food on less land and with fewer resources.

Engineers will have to recycle waste more effectively and help the world switch to clean, sustainable energy. Environmental scientists must restore Earth's ecosystems and protect what is left of its precious biodiversity.

The South African Agency for Science and Technology Advancement (SAASTA) helps to develop and nurture such a forward-thinking science base in SA.

The agency's educational programmes grow a pool of quality learners who will become the scientists and innovators of tomorrow through initiatives such as National Science Week, the National Science Olympiad, Primary Science Day, and role-modelling campaigns.

SAASTA's science awareness platform creates opportunities for South Africans to experience hands-on science via interactive exhibitions. Its portfolio of science communication activities makes people more aware of how science affects their everyday lives through mass media partnerships and creative writing and photography competitions.

**Emerging technologies**

Emerging technologies, such as biotechnology, nanotechnology and hydrogen and fuel cell technology, have huge potential to contribute to a greener future, and the Department of Science and Technology (DST) has a specific strategy to promote research and to build expertise in each of these areas. The DST has given SAASTA the responsibility of making these technologies relevant and accessible to the broad SA public.

**Biotechnology**

Biotechnology uses living organisms to make products or processes. An environmentally friendly alternative to traditional chemical processes, it can be used to:

- Produce biofuels from wood cellulose, grasses, non-edible parts of plants and even algae
- Farm more effectively using genetically engineered crops that are drought- and insect-resistant
- Reduce pollution from manufacturing processes
- Develop materials such as biodegradable bioplastics
- Transform bio-based waste into valuable feedstock or other useful products
- Harvest biogas from organic industrial waste
- Treat polluted waste water, such as acid mine drainage, with biological systems.

**Nanotechnology**

Nanotechnology is the manipulation of materials at an atomic level. It allows previously unimagined possibilities for preventing pollution and rehabilitating polluted environments. SAASTA's Nanotechnology Public Engagement Programme promotes public awareness and the use of nanotechnology to overcome the environmental and sustainability problems facing Africa.

**Hydrogen and fuel cell technology**

Hydrogen and fuel cell technology (HFCT) is an alternative energy source that ensures energy security and combats pollution. Switching to a HFCT economy will also lead to new high-tech industries, creating new jobs and services.

Platinum is a vital catalyst in hydrogen technology and this means that SA, with its vast resources of platinum group metals, is ideally placed to benefit. A national HFCT programme, launched in 2008, is aimed at increasing its socio-economic benefits in SA.

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NRF National Research Foundation | SAASTA South African Agency for Science and Technology Advancement

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*www.saasta.ac.za – South African Agency for Science and Technology Advancement*
*www.pub.ac.za – Public Understanding of Biotechnology Programme*
*www.sani.org.za – South African Nanotechnology Initiative*
*www.hydrogen.org.za – Hydrogen South Africa*
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