



National Research Centre

Cairo, Egypt

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Contents

- Research divisions
- Major activity
- Scientific records
- Fields of highest priority
- Suggestions to strengthen collaboration between member states



Research Divisions

Environmental Sciences

Oral and Dental Research

Inorg. Chem. Ind. and Mineral Resources

Org. Chem. Industries

Genetic Engineering & Biotechnology

Medical Sciences

Textile Industries

Engineering Research

Agriculture & Biology

Physics

Human Genetics & Genome

Food Ind. and Nutrition

Pharmaceutical Industries

Veterinary Research

-  Health and Environment
-  Industrial Research
-  Agriculture and Biology
-  Basic Science



Man Power

Research staff: 2800

Scientific assistance: 2200

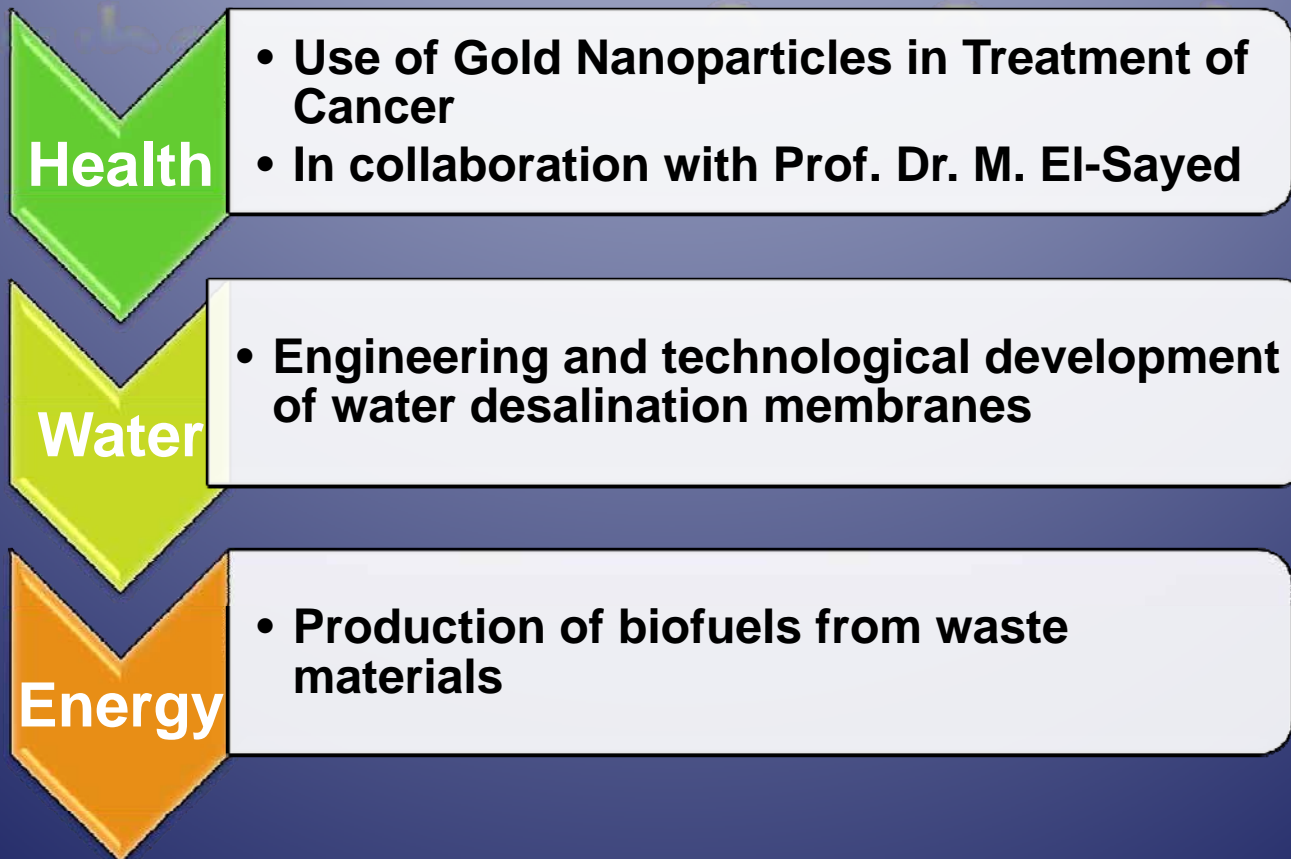
Administrative staff: 3000



Major Activities



Important On-going Projects





Research Groups

1- Renewable Energy

A- Solar Energy

- Using and development of solar energy equipments
- Design of solar cell system
- Fabrication of solar cell

B- Biofuel

- | | |
|--------------|--------------|
| - Biodiesel | - Biobutanol |
| - Bioethanol | - Hydrogen |



2- Water Research Group

- **Secondary treated water reuse
Technology evaluation and optimization**
- **Water Desalination Using Nano-filtration Membranes Based on Cellulosic Derivatives**
- **Novel Techniques for Algal Removal from Surface Water**



3- Nanotechnology and Advanced Materials Research Group

- **Electrospun gelatin/ PVA fiber mats containing silver nanoparticles for antibacterial wound healing**
- **Application of Nanotechnology for Modification of Synthetic Fibres**
- **High Performance Cotton Products Using Nanotechnology**
- **Some Medical and Environmental Applications of Carbon-nanotube Screen Printed Bio-sensors**
- **Synthesis and characterization of different poly(amide) nanocomposites based on montmorillonite/kaolinite via in-situ interfacial polycondensation and possible use as membranes**
- **Utilization of nano- bio- and other novel technologies in textile coloration**



- **Augmentation of multifunctional properties of nano-cellulosic fibers via nanobiotechnology**
- **Preparation and characterization of polymeric nanoparticles for drug delivery**
- **Preparation of new formulations of nano-hydroxyapatite with antibacterial agents for treatment of periapical and alveolar bone lesions**
- **Advanced and Nano-Materials for Renewable Energy (Wind Turbine applications)**
- **Advanced nanotechnology approaches for drug delivery**



4- Biotechnology

- **Plant Biotechnology**
- **Animal Biotechnology**
- **Bioactive Materials**



5- Agriculture

- Abiotic Stress
- Biocontrol
- Increased and oil crops productivity
- Increased productivity of horticultural crops
- Animal production



6- Waste management

- Removal of phosphate salts from waste waters by using some Egyptian rocks.
- Preparation and Characterization of Nanometric Porous Carbon and its Application in Environmental Remediation
- Recycling wastes of marble and granite quarrying and processing
- Evaluation of recycling and/ or reuse of some polymer wastes and improvement their applications in various technological fields
- Bio-removal of dye industrial wastewaters for reuse as alternative water in irrigation



7- Stem Cells

Human Stem Cells and Bone Repair.

Human stem cells activated to repair spinal injuries and Mandibulofacial deformities by Efficient Differentiation into bone forming cells



8- HCV

- Medicinal plants as a hepatocurative and hepatoprotective agents
- Preparation of Chitosan Nanoparticles and its Derivatives as Delivery System for Epitope Vaccine in Hepatitis C Virus (HCV)
- A study of the interaction between hepatitis C virus infection, pulmonary disorders and the response to treatment
- "New Approach Drugs from Algal Polysaccharide for Treatment of Hepatic Diseases"



9- Obesity

- **Role of metformin and curcumin in breaking the link between obesity and its associated health conditions**
- **Role of Acupuncture in management of obesity**
- **Visceral and Central Obesity as an Early Estimator for Obesity Health Risk: Management and Intervention**
- **The impact of maternal overweight and obesity on pregnancy outcomes**



10- Cancer

- **Fighting Cancer: A Multidisciplinary Approach for the Synthesis and Evaluation of Potential Novel Anticancer Candidates**
- **Novel Biomarkers as Promising Diagnostic Options for Solid Malignant Tumors**
- **Novel bionanocomposites based on carbon nanotubes and gelatin as new cancer therapeutics**
- **Environmental assessment of suspected carcinogenic pollutants in Egypt**
- **Fungi causing cancer as an environmental health problem in occupations at risk**
- **A novel understanding of Human Cancer in impact of Drosophila Tumor suppressor genes model**
- **Production of natural, microbial and mimic materials for prevention and treatment of cancers and other diseases.**



11- Diabetes

- Cardiac, vascular and endothelial assessment of patients with type 1 diabetes
- Biomarkers and Genetic risk factors for type 2 diabetic nephropathy
- Association between polymorphisms in TCF7L2 and KCNJ11 genes and type 2 diabetes and its complication in the Egyptian population
- Role of Cell Membrane Fatty Acids in Insulin Sensitivity in Streptozotocine Induced Diabetic Rats
- Identification of human serum biomarkers involved in type 2 diabetes pathophysiology



12- Human Genetics

- The use of recent advances in molecular cytogenetics for the prevention of mental retardation
- Biochemical Genetics studies for prevention of Mental Retardation
- Early noninvasive prenatal diagnosis and pregnancy care for the prevention of mental retardation



13- Functional Foods

- Development and evaluation of recent advances in specific nutritional therapy for management of metabolic syndrome among Egyptian adults
- Innovative and Development production of Natural Functional Ingredients from Algae
- Prevention and Management of Some Chronic Diseases (Renal and hepatic) by Nutraceuticals and Functional Foods.
- Therapeutic Effect of Gluten Free Diet on Psoriatic Patients with Gluten Sensitive Enteropathy.



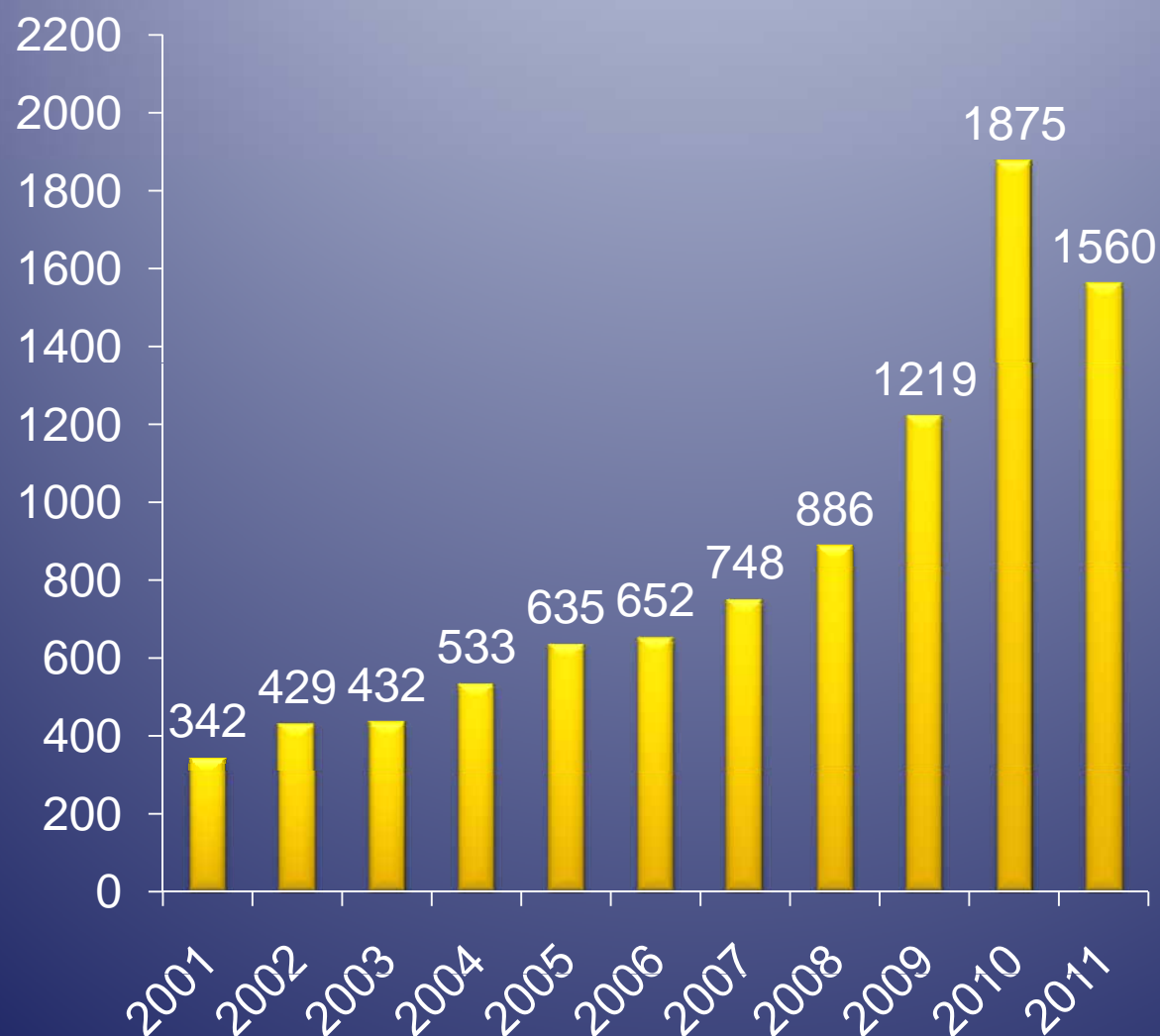
14- Polymers

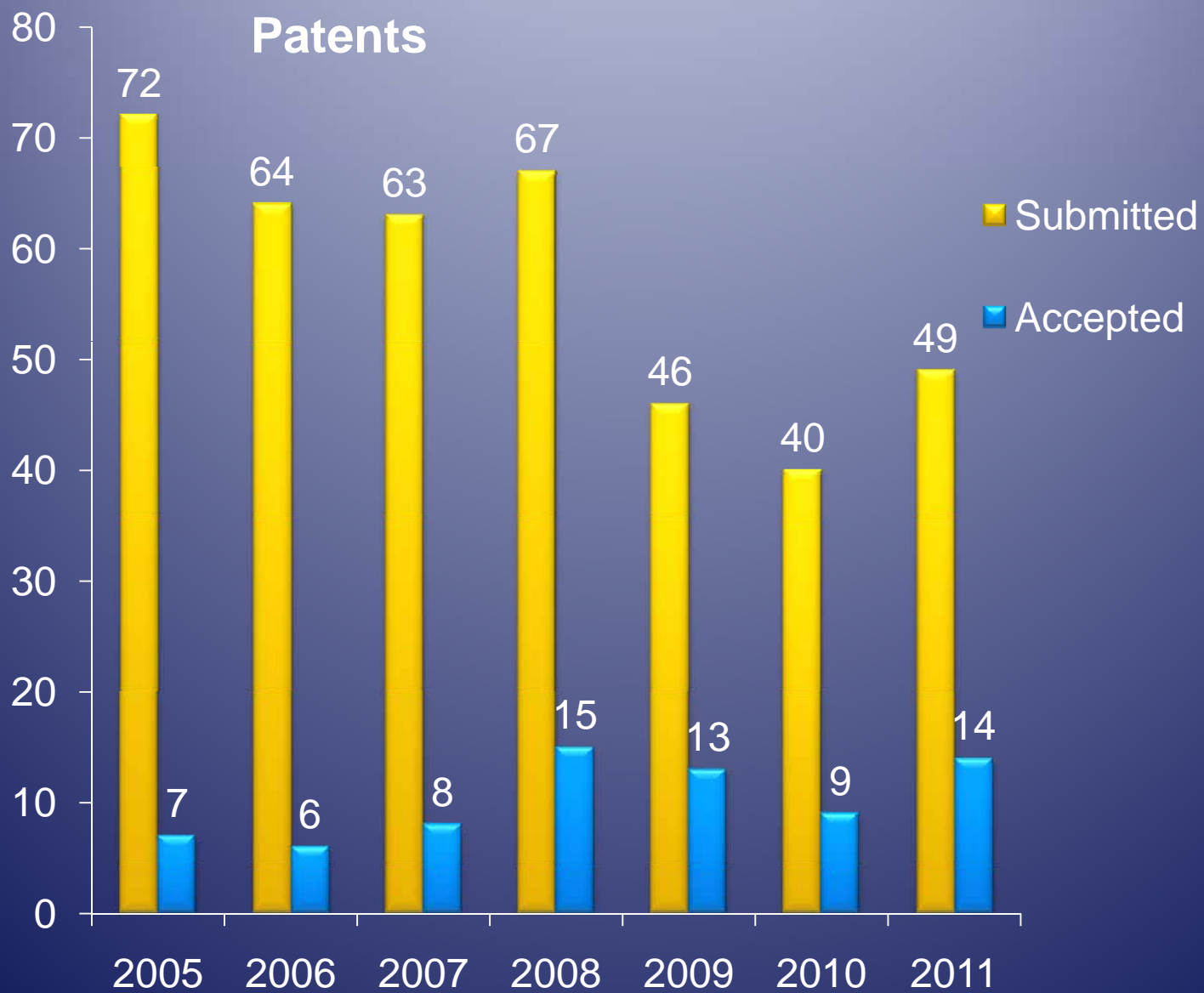
- **Advanced technological preparation methods in upgrading of Egyptian Kaolin required for different industrial applications**
- **Organic photoconducting and photodynamic materials**
- **High Performance Polymers, Pigments and Polymer nanocomposites for Industrial and biological applications”**
- **Utilization of MMT clay in pharmaceuticals as drug delivery**
- **Formulation and Experimental Evaluation of Polymeric Concrete Admixtures**
- **Industrial Applications for Lignocellulosic Materials**

Scientific Records



International Publication

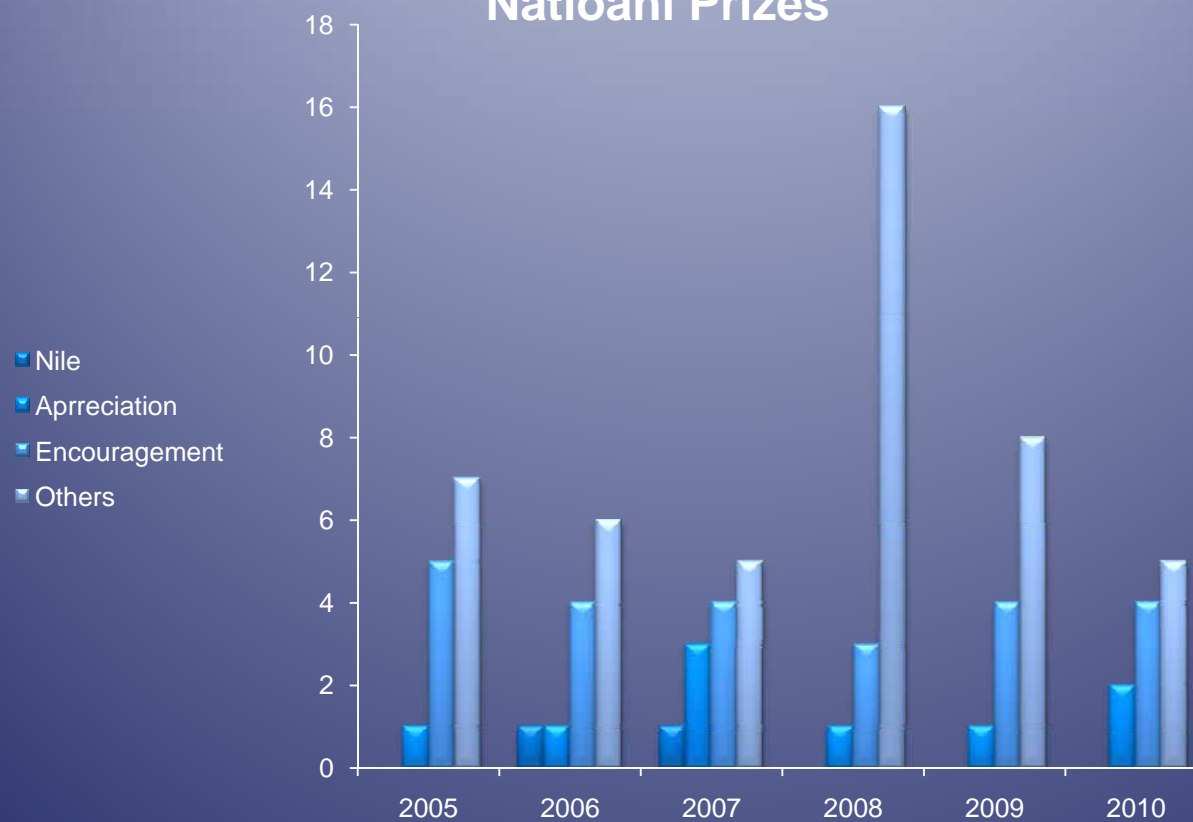








Natioanl Prizes



Apart from many other International prizes



Fields of highest priority

Renewable energy; especially the solar energy, in which the NRC has made progressive steps.



Water issues, like desalination, in which also the NRC has great experience either by producing new materials used as filters from textile materials, by staff from the Textile Research Division, or from new polymers, manufactured by Polymer Department staff.

Irrigation problems are also solved by many researchers to be utilized on small scale for the new communities in the desert.



Thirdly, we are focusing on **Agriculture** to increase the productivity of various crops; especially oil crops.

Moreover, many research is running to overcome the soil problems of cultivation in the desert.



Suggestion for South – South Scientific Collaboration

We are looking forward to enhance south-south scientific cooperation through:

- 1- Joint research work**
- 2- The training facility**
- 3- Technology transfer**



First: Joint Research Work

- The NRC welcome fruitful collaboration with the analogous institutions in the member states in almost all scientific fields; especially those of maximum priority for Egypt and related to the aforementioned topics.



Second: Training Facility

- **The Training centre** NRC has a great experience in the organizing training courses almost in all fields related to the different industrial and environmental sectors since 1983. The centre has organized thousands of national and international training courses in different scientific topics.



Third: Technology Transfer

- **NRC has entered its 57th year of providing technology transfer services for our nation. Our work has provided clients with technical and market research expertise dedicated to customer service.**



- **NRC is inspired by the patents and technologies developed at our labs. In the meantime, we are looking forward to transfer new technologies through cooperative work with the analogous institutions all over the world.**

Future Cooperation NRC-TÜBITAK

Waste water
lab

Air pollution
lab

Solid waste
management

Polymer
Technologies

Material
Sciences



Thank You