



# ***National Research Centre*** ***Cairo, Egypt***

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## **NRC 2019**



**Since 1956**

- **12 Feddans.**
- **11 Research buildings.**
- **2 Administration buildings.**
- **10 Store rooms.**
- **Animal houses.**
- **Green houses.**
- **5 Experimental stations.**
- **Research farm 350 feddans.**



# NRC

*The major multi-disciplinary  
R&D Institute in Egypt*

- Devoted to basic and applied research.
- The largest of all institutions affiliated to the Ministry of Scientific Research.
- Employs 70% of all scientists working in these institutions.
- Correspond to the country's key production and services sectors.



## NRC Mission

Conduct Basic and Applied Research

In



Different Fields of Science and Technology

To



Strengthen the National Economy



## NRC Objectives

Contribute

- Contribute in national upgrading of science & dissemination of knowledge

Guide

- The National Economy

Strengthen

- scientific linkages and cooperation with local and international organizations

provide

- scientific services and consultations

Training

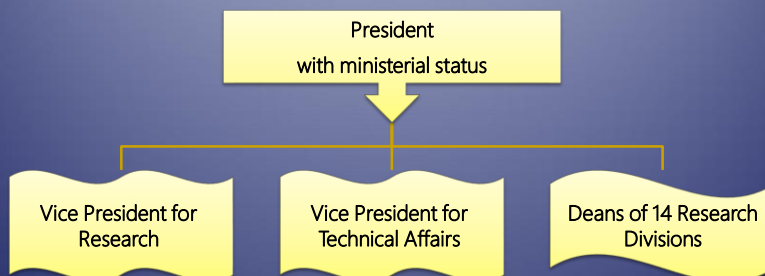
- Graduate students



## Organization Structure



# Organization structure



## Organization Structure (cont.) Research Divisions



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



## Highlights of the Progress made during the Last Year (2018)

2033  
publication  
(SCOPUS)

21 approved  
patent

26 NRC awards

233 book  
chapters

36 convoys



## Highlights of the Progress made during the Last Year (The 1<sup>st</sup> Quarter in 2019)

625 publication  
(SCOPUS)

8 approved  
patent

12 NRC awards

56 book  
chapters

11 convoys



## Highlights of the Progress made during the Last Year



**Prof. Ashraf Shaalan**  
President of the NRC,  
November 2009 – November  
2018



**Prof. Mohamed Hashem**  
President of the NRC,  
November 2018



## Highlights of the Progress made during the Last Year

### Main Axes of the 12<sup>th</sup> NRC Research Plan (2019 – 2022)

Strategic  
Industries

Frontier  
Sciences

Water

Energy

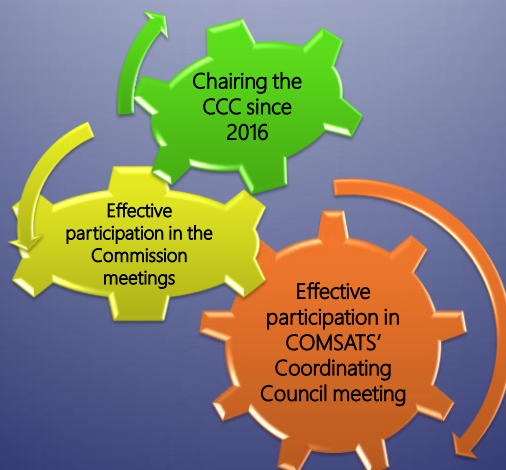
Agriculture  
and Food

Health and  
Population

Community and Sustainable  
Developments



## Previous Collaboration with COMSATS



## Previous Collaboration with other Centres of Excellence

5 fellowships  
for COMSATS  
member states

*Textile  
Processing*

Plant  
Biotechnology

Plymers

Bioactive  
Materials

Nanotechnology  
in Engineering

## Previous Collaboration with COMSATS

**International Workshop: Water Resources: Expected Crisis and Strategies of Predomination", 2019**

## Previous Collaboration with COMSATS

Hosting the 10<sup>th</sup> & 20<sup>th</sup> CCC meeting on 2007 & 2017

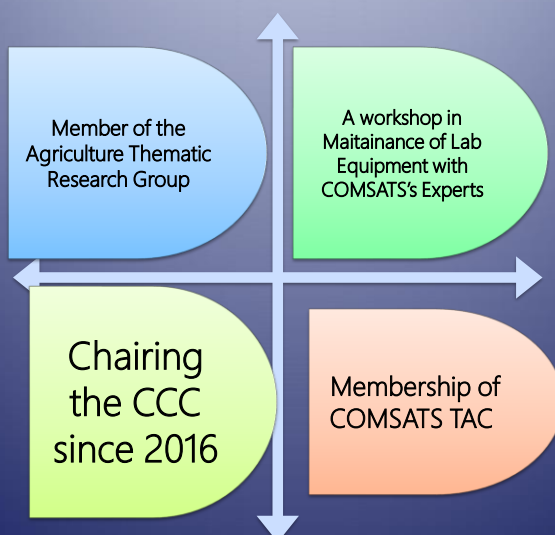


## Previous Collaboration with COMSATS

Hosting the  
International  
Conference on  
Agriculture, Food  
Security, and  
Biotechnology;  
8<sup>th</sup> – 9<sup>th</sup> June  
2105



## Collaborations with other Centres of Excellence





## Collaborations with other Centres of Excellence

MoU with the  
International Center for  
Climate and  
Environment Sciences,  
Institute of  
Atmospheric Physics,  
CAS, Chin



## Collaborations with other Centres of Excellence

MoU with the CUI,  
Karachi, Pakistan





## Collaborations with other Centres of Excellence

Letter of intent with the  
BCSIR, Dacca,  
Bangladesh



## South - South Cooperation

Egypt has announced a number of initiatives aimed at boosting more investment, economic integration and greater cooperation among African states, as President Abdel Fattah Al Sisi calls for urgency in tackling Africa's needs.

The Africa 2018 Forum, held under the patronage of President Al Sisi, was organised by the Ministry of Investment and International Cooperation of Egypt and the COMESA Regional Investment Agency (RIA).





## Proposed future elaboration with CCC

### Egyptian Funding Opportunities

Science and Technology  
Development Fund (STDF)

Academy of Scientific  
Research and Technology

Status: Currently with China and  
Tunisia



## Plant Biotechnology

*In vitro* propagation of some  
important economic plants



Production of virus-free plants



Various biotechnology techniques in  
conservation of plant genetic resources



Production of plants resistant to fungal  
and viral diseases



## Plant Biotechnology

Isolation and Identification of  
important proteins and genes



Semi-industrial production of natural  
compounds with pharmaceutical and industrial  
uses



Hairy roots cultures production  
Techniques



## Plant Biotechnology

DNA fingerprinting and detecting the  
genetic diversity in plants



Techniques for cytogenetic study in  
different plants



Bioinformatics application in plant  
biology



## Plant Biotechnology – Equipment



Thermal Cycler



Light Microscopes



## Plant Biotechnology – Equipment



Laminar Air Flow Class II



Bench Top Cooling Centrifuge



## Plant Biotechnology – Equipment



Gel Documentation



One-dimensional SDS gel electrophoresis of proteins



## Examples of ongoing Projects in Industrial Biotechnology

Use of gene markers in for improving production of twins in sheep and goat

Some immune genes in Egyptian buffalo towards its immunity improvement

The use of plant biotechnology techniques for optimizing production of natural product(s)

Checking the presence of antibiotic resistance marker genes in plant crops and their possible incorporation in DNA of animal and bacterial cells



## Examples of ongoing Projects in Industrial Biotechnology

Enhancement of lipid production from isolate fungal by mutagenesis for biodiesel production

Improvement of abiotic stress tolerance in Egyptian rice via genetic transformation

Screening, Improvement and Scale up Production of Pullulanase Isolated from Local Bacterial Isolates and its Application in Raw Starch Hydrolysis Industry

Microbial Synthesis of Nanoparticles as potential new generation of broad spectrum antimicrobial agents



## Some laboratories working in biotechnological application

Biochemistry

Cell Biology

Genetics and Cytology

Microbial Genetics

Microbial Chemistry

Molecular Biology

Plant Biotechnology

Agricultural Microbiology

Microbiology and Immunology

**Biotechnology Pilot Plant**



Some laboratories  
Utilizing Industrial  
Biotechnologies

Textile

Coloration

Detergents

Paper

Food

Fatty  
matters



## Some Proposed Topics for Cooperation with CAS and IBT

**Green Technologies promotes  
the traditional textile industries**

**Construction of Fungal Cell  
Factory from Chemical  
Production from Biomass**

**Inositol production from  
starch via *in-vitro synthetic  
enzymatic biosystem***



## Some Proposed Topics for Cooperation with CAS and IBT

Biotechnologically-propagated mulberry cultivation

Sericulture

Textile product thereof



# Thank You