An Egyptian pioneering test for Hepatitis C Virus

A step forward to fight an endemic Egyptian disease and a long lived Egyptian dilemma
An Egyptian Pioneering Hepatitis C Virus Test

- A group of researchers known as National Diagnostics Therapeutics (NDT) led by AUC Chemistry Professor Hassan Azzazy achieved a breakthrough HCV test.

- Nanotechnology to help in the early detection of Hepatitis C Virus (HCV).

- This discovery has granted Azzazy and his team international recognition.

- NDT is a multidisciplinary group established five years ago at AUC to provide innovative and affordable solutions to medical problems.
What is Hepatitis C and Hepatitis C Virus?

- Hepatitis C is a serious disease that affects the liver
- HCV represents a specific threat to public health in Egypt
Modes of Virus Transmission

- Hepatitis C is caused by Hepatitis C Virus (HCV) - transmitted through contact with infected blood.

- The most common modes of transmission include: reuse of disposable syringes, contaminated medical tools and blood transfusion.
HCV: A National Pandemic and an Economic Predicament

- 150 million people worldwide are HCV chronically infected according to WHO reports in July 2013

- More than 350,000 HCV deaths are reported every year

- Egypt ranks first worldwide in terms of the rates of chronic hepatitis infections (WHO, July 2012)
HCV: A National Pandemic and an Economic Predicament

- 15 percent of Egypt’s population are suffering from the virus with an estimate of 12.7 million in July 2012

- 150,000 to 500,000 people are infected annually in Egypt

- Only 20 percent of the cases can recover while 80 percent usually develop more chronic liver–related complications
Current HCV Testing

- Expensive and time consuming
- Two step testing
  - First is an antibody test. If positive, the patient has to go through a follow up PCR test that looks for the genome of the virus.
  - A positive PCR test result indicates that the patient is infected with an active Hepatitis C
  - The first antibody test costs EGP 20-40 while the more expensive PCR test costs EGP 250-500 depending on the place where the test is taken
Azzazy’s New HCV Innovative Test

- Saves time and money
- Increased recovery rates by 90 percent provided the virus is detected during the first six months.
- One hour test.
- Detects the virus in a single step, eliminating the time and cost required for the duo of antibody and PCR tests
Azzazy’s New HCV Innovative Test: Mechanism

- Gold nano-particles and nanotechnology
- Centrifuging a blood sample
- RNA extraction
- RNA molecules react with the gold nano-particles as well as a short DNA sequence that recognizes the HCV genome
- Test result determination
Benefits of early HCV Detection

- Minimizing the HCV pandemic:
  - Media campaigns
  - Raising awareness
  - Role of health professionals in educating the public
BUSINESS PLAN
The Innovative Test’s Business Plan

- Business plan- test’s possible negative effects
- HCV test implementation
- The plan demonstrates that the HCV test is a feasible business with each test costing around EGP 30 subject to 5 percent annual inflation
The plan demonstrates the benefits of the test as follows:

- Importance of early virus detection
- Cost of the test saves patients future costs
- 30 percent of 10,000 annual liver transplants are a direct result of HCV. Both transplant and the treatment per person can cost EGP 400,000. If the detection test is taken early it could save a total of 1.2 billion spent on liver transplants annually
D-Kimia: A Hub for Innovation

- Spin-off company launch
- Following D-Kimia, another US based company will also be launched at the end of this year.
- AUC signed the licensing agreement for the patents of D-Kimia, the first license issued for a start-up at the university.
- D-Kimia’s distribution of the HCV test
- D-Kimia aspires to offer innovative affordable medical solutions and help patients that were otherwise unable to reach proper medical care.
D-Kimia: A model to follow?

- Azzazy hopes to inspire many researchers and engineers in Egypt with D-Kimia to follow the same model in order to develop “know how” in Egypt.

“We need to develop our ‘know how’ in Egypt and protect it with a patent in order to start a new company. This patent would then be the asset of the company. We should then develop the company to create prototypes that could help the economy, the unemployment, and the other problems in the country” Azzazy told AUC Business Review
Scientific Research in Egypt: Prospects and Challenges
Scientific Research in Egypt: Prospects and Challenges

- Researching national problems is a direct contribution to the economy on many levels:

  - Generating income by turning a new discovery into a product
  - Protecting discoveries with patents which in turn would be the assets for companies like D-Kimia that would also provide employment opportunities
  - Researching and finding medical solutions would reduce the costs of sickness/illnesses on the national level
Moving Forward?

- The idea of materializing an invention to prototypes, starting a spinoff company, having a patent and licensing began to grow in Egypt, yet still has a lot of shortcomings

  - Lack of efforts from the private industry in supporting scientific research and innovation
  - Corporate Social responsibility
  - Problems in the marketing efforts for new discoveries
  - Lack of awareness among the population regarding certain health threats
Thank you

Q & A