

*“The Contribution of Medical
Biotechnology in the
Sustainability of Human
Society”*

Wilson Byarugaba¹, Misaki Wayengera^{1*}

Restrizymes Biotherapeutics (U) LTD

P o Box 16606, Kampala, Uganda

Science for the people

“Concern for making life better for ordinary people must be the chief object of Science. Never forget that when you are pondering over your diagrams and equations”

-Albert Einstein, *to Caltech students*

People for Science

- Pre-industrial revolution era; achieves of western Europe (J Gribbin)-suggestive of poorly-organized human societies (villages) that were highly prone to disease
- Albeit, after the 'industrial revolution; human societies organized around infrastructures as towns: less prone to disease, blossom in population, prosperity of economies, nations

Background I:

Biotechnology

- *Bio-technology= life-applied knowledge*
- **Biotechnology** may thus be **defined as** the application of knowledge of, *either natural or recombinantly modified, whole or parts* of living things-inclusive of their secretory derivatives, to improve human welfare.
- Dates back far as, and is rooted in the antiquity; up to the C21st advances in our understanding the gross and molecular behaviors of living things.

Background II:

Sustainable, human society

- Sustainability-is a projected, steady state of continued existence, maintenance and self-renewal (propagation).
- In human-societal terms, sustainability has implications on: the economics, sociology and politics; of that society.
- Society without healthy members, can not expect to be sustainable, be it economically, socially or politically
- Health: “holistic- state of well-being, and not merely the absence of disease”-WHO.

Background III

Medical Biotechnology

- **Medical biotechnology** is that sub-categorization of *biotechnology* whose focus, is to improve health.
- Medical biotechnology can contribute to the sustainability of human society, by fostering the health of society's members.
- How Possibly?

Areas of contribution

- ***Enacting and sustaining a disease-free community***
- Ensuring food security and nutrition
- Cleansing and protecting the environment
- Fostering academic diversity*
- Enabling intellectual-prosperity: Knowledge economy.*

Enacting and sustaining a disease-free community

1. Diagnostics research & development (R 'n' D)
2. Drug (s) R &D
3. Vaccine (s) R &D
4. Other bio-therapeutics: stem cells, fertility treatments, *e.t.c.*

Above four, now manned by companies listed as biotechs. These are the potential future replacement to the conventional pharmaceutical company

Global estimates are, that by 2015(5 years from now), the global biotech industry will be worth a staggering US\$ 15 trillion

A closer View

The Ugandan example of Restrizymes Biotherapeutics (U) LTD

Retrizymes-B (U) Ltd is a Uganda founded (2008) and based biotech,

Core administrative arm: Prof Wilson Byarugaba (presidential CEO), Dr Henry Kajumbula (administrative CEO), and Dr Misaki Wayengera (Scientific CEO)

Vision: To become masters of frontier biomedical research and innovation as a strategy to combat disease and enhance development in Uganda and beyond”

Mission: “Identify and develop molecular targets as novel biomedical diagnostics, therapeutics and vaccines”

Rationale for R-B (U) Ltd

- Global Trend: Knowledge based economy
 - Today, shift from material and labor to knowledge economy e. g “It is estimated that the global biotech industry will be worth a staggering US\$15 trillion by 2015(5 year down the road)” what is our stake; how do we cease being consumer idiots of biotechnology?
- Global Image on the Biotech scene
 - Need to demystify the “insinuado” that Africans can not lead in knowledge. There is need to economically liberate this country and Africa”
- Transform academic goals
- Ensure sustainability of human society in Uganda and beyond

Science-Advances Used

- High-throughput biotechnologies. E.g. *Genomics, OMICS, and Bioinformatics*
- Recombinant and Biological engineering technologies
- Stem and regenerative medicine technologies
- Nano-biotechnology

Figure-Slide

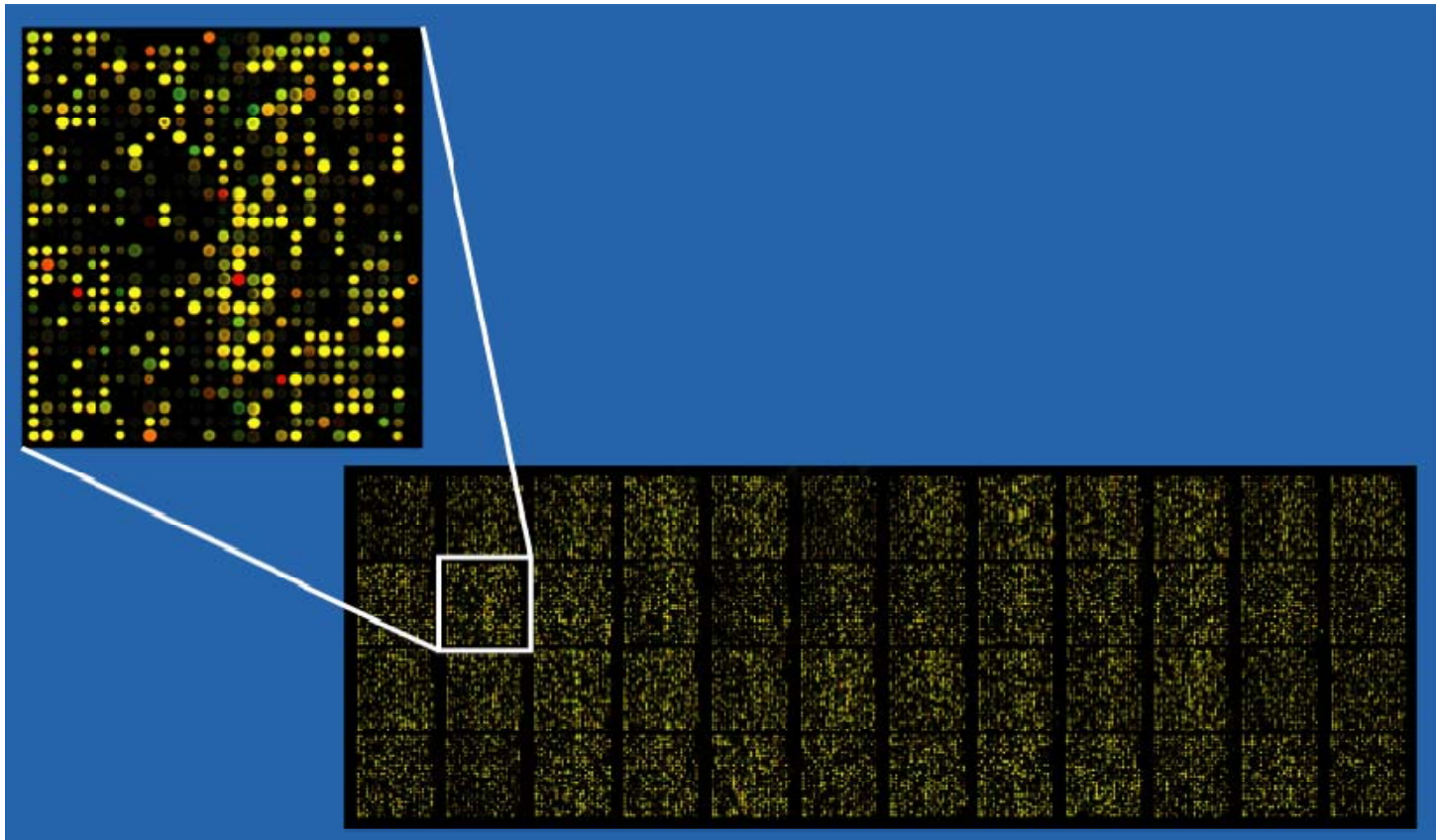


Figure Slide

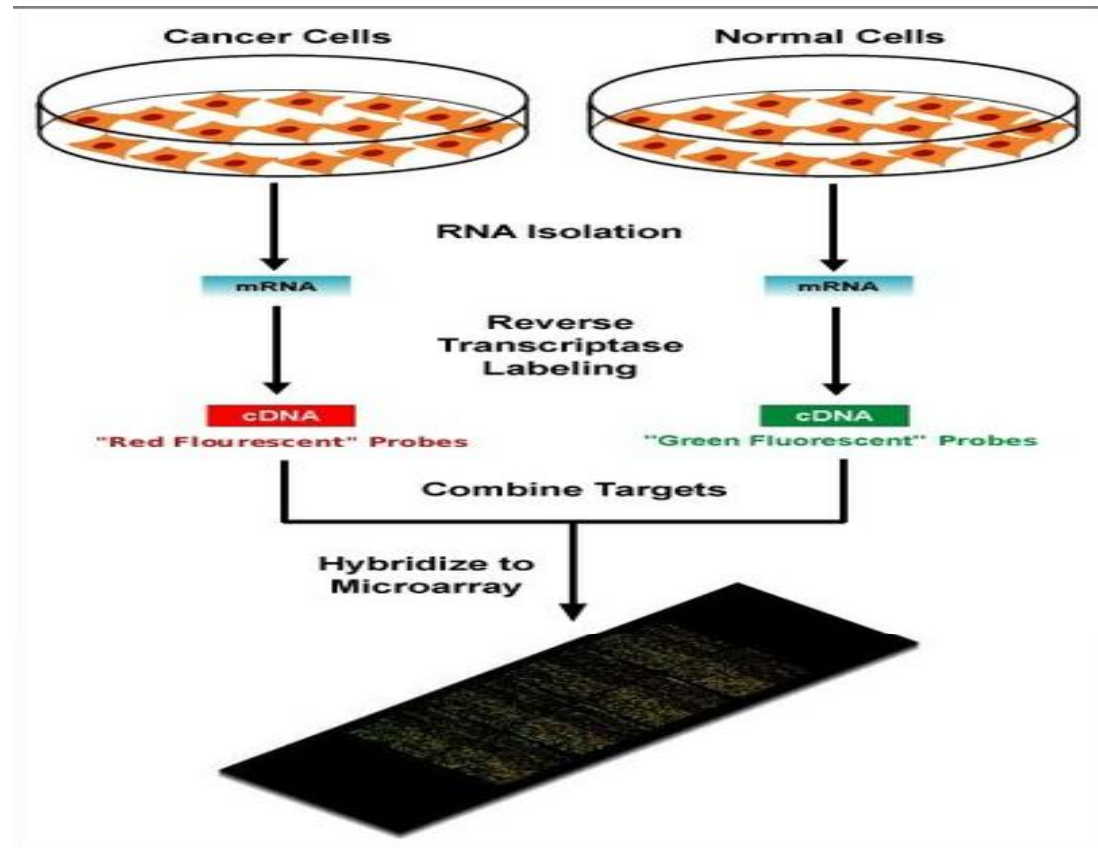
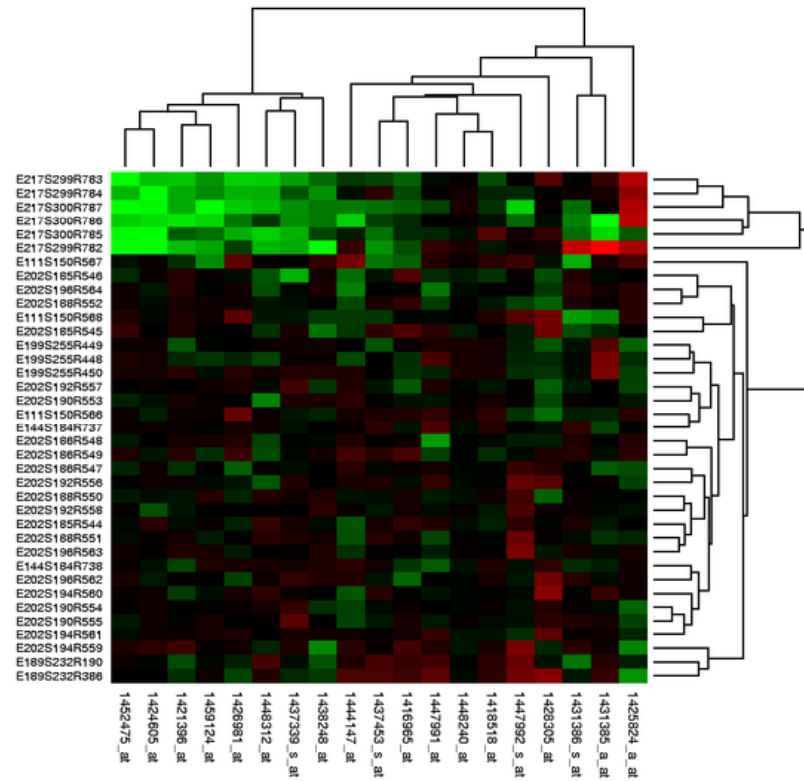


Figure Slide



R-B (U) LTD to the Dot!

- **Diagnostics:** Ebola, TB Biomarkers, that can be used at the point of care (village health centers); Mosquito biomarkers
- **Drug (s):** Smart, nano-HAART, nano-TB chemotherapy
- **Vaccines:** Immune-modulative HIV vaccine
- **Others:** Live microbicides (HIV, HSV-2)

Acknowledgements

- Dr Henry Kajumbula, administrative CEO; R-B (U) LTD
- KIU-WC, Ishaka, Uganda
- MakCHS, Kampala, Uganda
- The Uganda Society

End!

