

Medicines for Neglected Diseases Workshop

Opportunities for Training, Funding, and Collaboration in the NTD Field

Boston University Sept 11, 2010

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The Institute for Immunology and Informatics (I'Cubed)

Mission:

To design safer, efficacious vaccines and therapeutics using novel computer-based (informatics) immunology tools.

Focus:

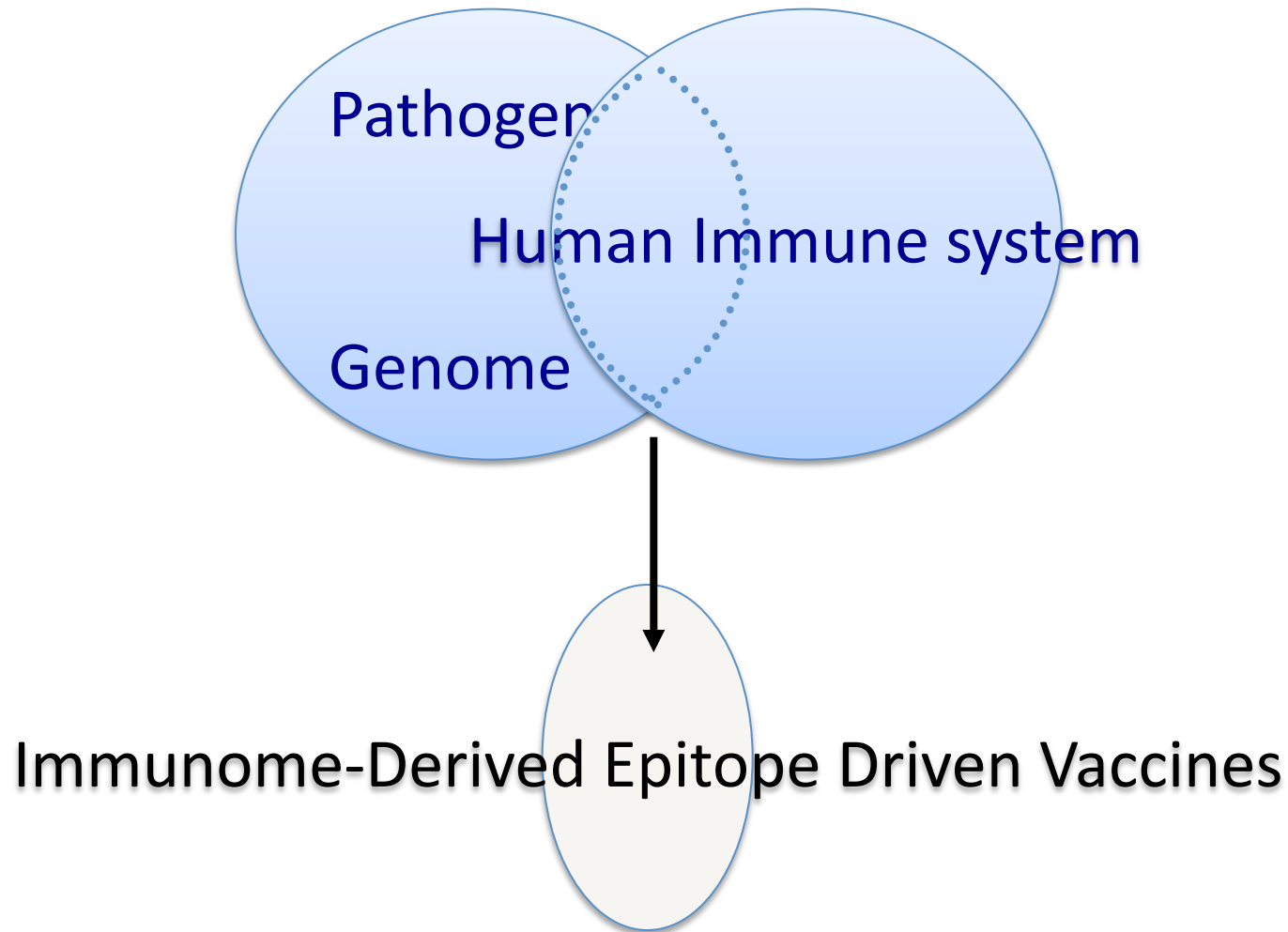
Accelerated vaccine discovery for infectious diseases, biodefense and NTDs.

Training the next generation of scientists in immunoinformatics.

Background:

- *Informatics tools moved from a private company, EpiVax, Inc. (Dr. Annie De Groot) to URI for research purposes*
- Established ties to the Developing World (Mali, Africa)
- Large network of collaborators
- Completely grant funded

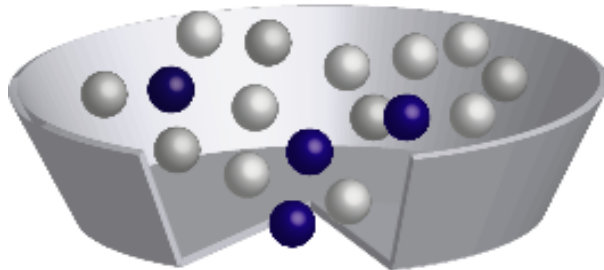
The I' Cubed Approach to Vaccines



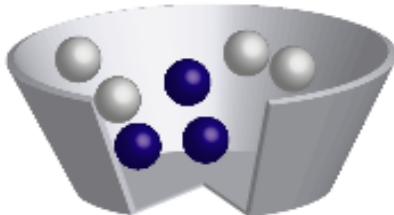
Design vaccines based on peptides from the genome of the pathogen that will generate protective immunity



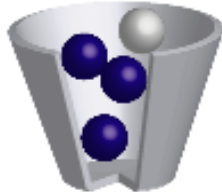
In Silico Predictions



In Vitro Evaluation



In Vivo Evaluation



Vaccine

Methods

- **Genomes** mined using computational and experimental tools to identify genes that encode proteins with promising vaccine antigen properties such as secretion, up-regulated expression, and immunogenicity.
- **In silico.** Immunoinformatics tools are used to map protein sequences for short, linear putative T-cell epitopes.
- **In vitro.** Candidates are synthesized as peptides and evaluated for MHC binding and antigenicity.
- **In vivo.** Prototype epitope-based vaccines are evaluated for immunogenicity and protection in mice transgenic for human MHC.

I' Cubed funded with a 13M dollar NIH grant: (TRIAD) Immunoinformatics to accelerate the development of vaccines for emerging infectious diseases and biodefense

➤ Vaccine Projects:

- Hepatitis C virus (liver cancer)
- H.pylori (gastric carcinoma)
- Tick-borne diseases (e.g. Crimean-Congo haemorrhagic fever, Lyme disease)
- Vaccine Delivery Vehicles (non-tolerogenic anti DEC 205)
- Multipathogen Biodefense vaccine: Burholderia Mallei and pseudomallei, F. Tularensis

➤ Training Initiatives

Funded Opportunities for Training at I'Cubed in Neglected Diseases

- **NTD@TRIAD**
 - Establish web site (iVAX) to make immunoinformatics tools and NTD genome sequence information available to NTD researchers.
 - Develop vaccines for Malaria, Leishmaniasis, Schistosomiasis, Onchocerciasis, tick borne infectious diseases and others.
 - 3 weeks of training Jan 2011 for Ph.D. fellows to use our informatics tools then apply tools in home labs

Information: Dr. Shahla Yekta, shahla.yekta@gmail.com

Funded Opportunities for Training at I'Cubed

- **Vaccine Renaissance Conference Oct 21-23, 2010**
 - Day 1, immunoinformatics and vaccinology training at URI, Providence.
 - Day 2 and 3 vaccine conference (HIV, HPV, Prophylactic Breast Cancer, Ebola, Flu and others)
 - Great opportunity for networking
 - Registration is free!

For more information: Contact.ICubed@gmail.com

and see <http://immunome.org>

Funded Opportunities for Training at I'Cubed

- **TRIAD Toolkit**
 - 2x per year (May and Oct) training at I'Cubed to use the immunoinformatics tools plus hands on immunology training
- **Pilot Projects Supported**
 - \$150,000 per year given out in grants from I'Cubed in infectious diseases or emerging infectious diseases
 - (Attendance at the TRIAD training sessions required)

Founding a company for NTDs

Some personal experiences:

**Co-Founded a non profit organization with Dr. Peter Farina :
Developing World Cures, Inc.**

- Recruited 12 highly experienced scientists and executives
- State of CT supportive: CURE provided infrastructure and legal support. Pro Bono Partners: legal support

Challenges:

- Fundraising/grant writing (takes a huge amount of effort!)
- Collaborations with Universities

Opportunities:

- Collaborations with Biotech

Closing Thoughts

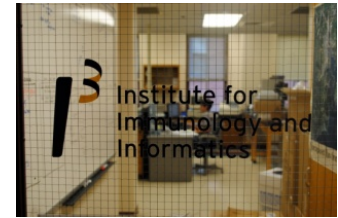
There is Funding Available for NTDs

If you are new to NTDs consider collaborating with an experienced group

Places to Look for funding and/or collaboration:

- ❖ Research Institutes (such as I'Cubed)
- ❖ grants.gov (NIAID)
- ❖ Non profit organizations such as DNDi, BMGF, others.
- ❖ Biotechs (Small Business Innovation Research Grants)

Acknowledgements



Special Thank you to **Annie De Groot**: Founder of I'Cubed