Basic Vaccine Research, Preclinical and Clinical Studies: An Investigator’s View

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An investigator’s simple mind

IS THERE A BETTER WAY?
The scientific challenges are many, but it is precisely the unresolved questions that attract rather than discourage the scientific community. The triad of basic vaccine research, preclinical and clinical studies continues to attract dedicated and highly skilled scientists.
Pandemic influenza vaccine:

For the scientist the situation has never before been so full of promise and purpose.

Never before have the goals been so clear, and never before has the public acceptance for what is going on in the ivory towers been higher.

We have an unusual situation where scientific challenges are exactly mirroring a global need.

Never before has there been a better opportunity for the scientists to try out their ideas in clinical trials within a reasonable period of time. Or?
For a sudden and urgent need for a new vaccine, the pandemic influenza situation is an illustrating point:

Trying out a novel vaccine concept in man, or indeed just a variation over a well-proven formulation is a time-consuming, intricate and expensive exercise.

Following the zoonotic cases of avian influenza and the pandemic threat, and the pressing need to formulate, manufacture and license an efficacious pandemic vaccine in time and in sufficient quantities, we have realized that the current modus operandi is inadequate.
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Source: WHO

The Influenza Centre, The Gade Institute, University of Bergen
What are the problems?

Edward Munch: The scream, 1893
As seen from the laboratory bench, a humble investigator is facing two major problems/obstacles/cultural clashes:

1): The vaccine manufacturers
2): The governments

These are formidable structures that can discourage or downsize the most enthusiastic investigator.

There are other challenges, such as licensing and regulatory issues, legal/liability and ethical questions and intellectual properties. I will not discuss these.
Problem 1:

The vaccine industry sets their R&D priorities based on business criteria with strategic time-lines made out years in advance. An “interesting” vaccine proposal may not be so unless it is scientifically, technically and financially feasible, has a market opportunity, as well as a likely acceptance from health authorities that the new product is needed.
Manufacturers of seasonal influenza vaccines have their people and production facilities tied up for most parts of the year. Consequently, for externally initiated proposals, there may be little opportunity to produce small-scale investigational vaccines.
To ensure a shorter time from “Seed to Syringe” for investigational vaccines, we need:

Highly flexible “lean and mean” companies/institutions
• able to manufacture clinical grade trial lots on short notice, especially those experienced in using alternative and/or novel vaccine substrates with the potential of rapid and significant up-scaling.
• able to manufacture and deliver clinical grade and toxicology approved experimental adjuvants on an equally short notice.

Here we may see many openings also for joint ventures that could be commercially interesting.
Problem 2:

With some notable exceptions, the authorities in the industrialized world have mostly taken a “wait-and-see” position.

A pandemic vaccine is considered by governments to be an industrial challenge rather than a public health issue.

(David Fedson, on numerous occasions)

Governments should rather assume a leading role in facilitating vaccine development.

Most importantly, however, is the availability of substantial public funding, including direct grants and competitive tenders from governments.

EU: €90 million since 2001
USA: billon(s) $?
World Bank estimates a pandemic to cost 800 billions to 2 trillions $
from one of the concluding remarks….

- *The problem is not simply a lack of money; indeed, the scientific community is barely able to absorb all the money currently directed toward pandemic influenza research.*

Not quite so for vaccine projects:

- For example, considering the tasks at hand, the EU grants are grossly under-funded. All partners – and particularly the industrial consortium members, - may have to subsidize the projects to a significant degree.
- The time-lines and deliverables are stifling enthusiasm and deterring to a large degree “turn-arounds”.
When it was simple!
Edward Jenner 1796
How can we influence our politicians to take charge and go for a joint global effort?

*Which is the most powerful argument aimed at politicians and decision makers?*

**Their legacy!**

What will the historians say? Inertia and lack of actions will not be taken lightly by the (surviving) public. The history will be a harsh judge. Dipping in tar and rolling in feathers. No re-election, no authorized biography.
Edvard Munch. Self portrait, 1919 (surviving the Spanish flu)
The scientific community is ready; we are expecting our governments to follow.