



Institute for OneWorld Health

A Nonprofit Pharmaceutical Company



PDP Partnerships for Improved Global Health

Semisynthetic Artemisinin Partnership

Nina E. Grove, MA, MPH

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iO^{WH} Mission

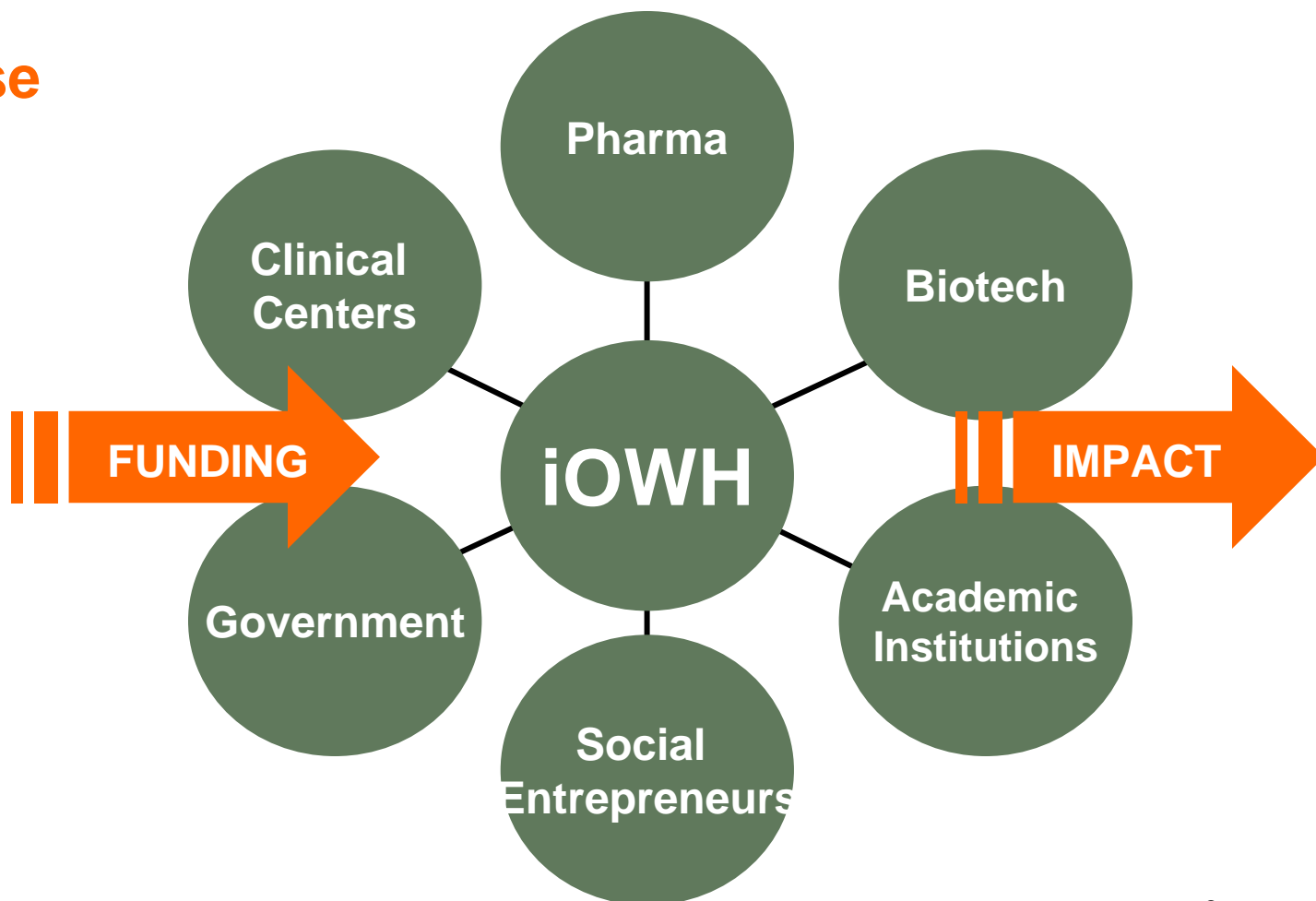
**The Institute for OneWorld Health Develops
Safe, Effective, and Affordable
New Medicines for People with Infectious Diseases
in the Developing World**



Product Development Partnership (PDP) with a Global Network

iOWH Expertise

- Product Development
- Project & Partnership Management
- Access & Operational Research
- Advocacy & Strategic Communications
- Liaison with funder



iOWH Malaria Disease Program

- Vector-borne **protozoan** disease from the bite of female **phlebotomine Anopheles mosquitoes**
- 300-500 million people infected annually
- **1+ million people die each year**
- Worsening problem of **resistance** to common/cheap drugs
- The compound **artemisinin** is extracted from the wormwood plant (*Artemisia annua*) and has **> 90% efficacy rate**



Source: World Malaria Report 2005, <http://rbm.who.int/wmr2005/html/1-2.htm>

Malaria Program Landscape

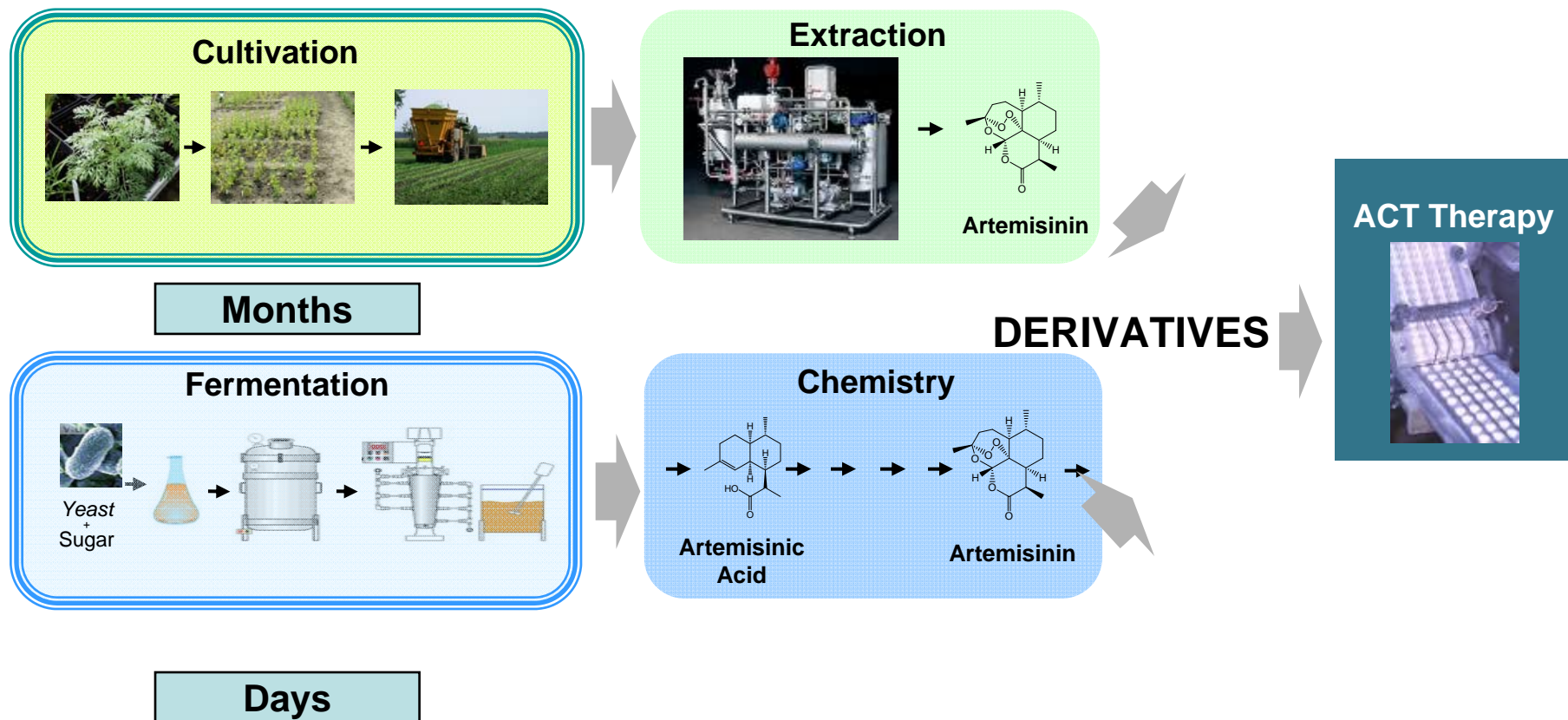
- In 2001, the World Health Organization (WHO) recommended **artemisinin-based combination therapy (ACT)** as 1st line treatment for uncomplicated malaria.
- Malaria control requires multi-prong approach, with **drug therapy** being key component
- While many countries have adopted the WHO recommendation, **Access** remains a barrier to use in many developing countries
- The artemisinin **supply chain is volatile** and may not be able to meet projected demand
- ACT **demand will increase** with implementation of the Affordable Medicines Facility for Malaria (AMFm)
- In Oct 2007 the Director-General of the World Health Organization declared the agency would seek to **eradicate malaria**

Semisynthetic Artemisinin Project Goals

- Create a nonseasonal, high-quality and affordable artemisinin to supplement the current plant-derived supply
- Stabilize the price of botanical artemisinin and reduce risk in the event of a supply disruption
- Ensure semi-synthetic artemisinin is available to all eligible manufacturers who comply with WHO/GF harmonized treatment guidelines and quality criteria

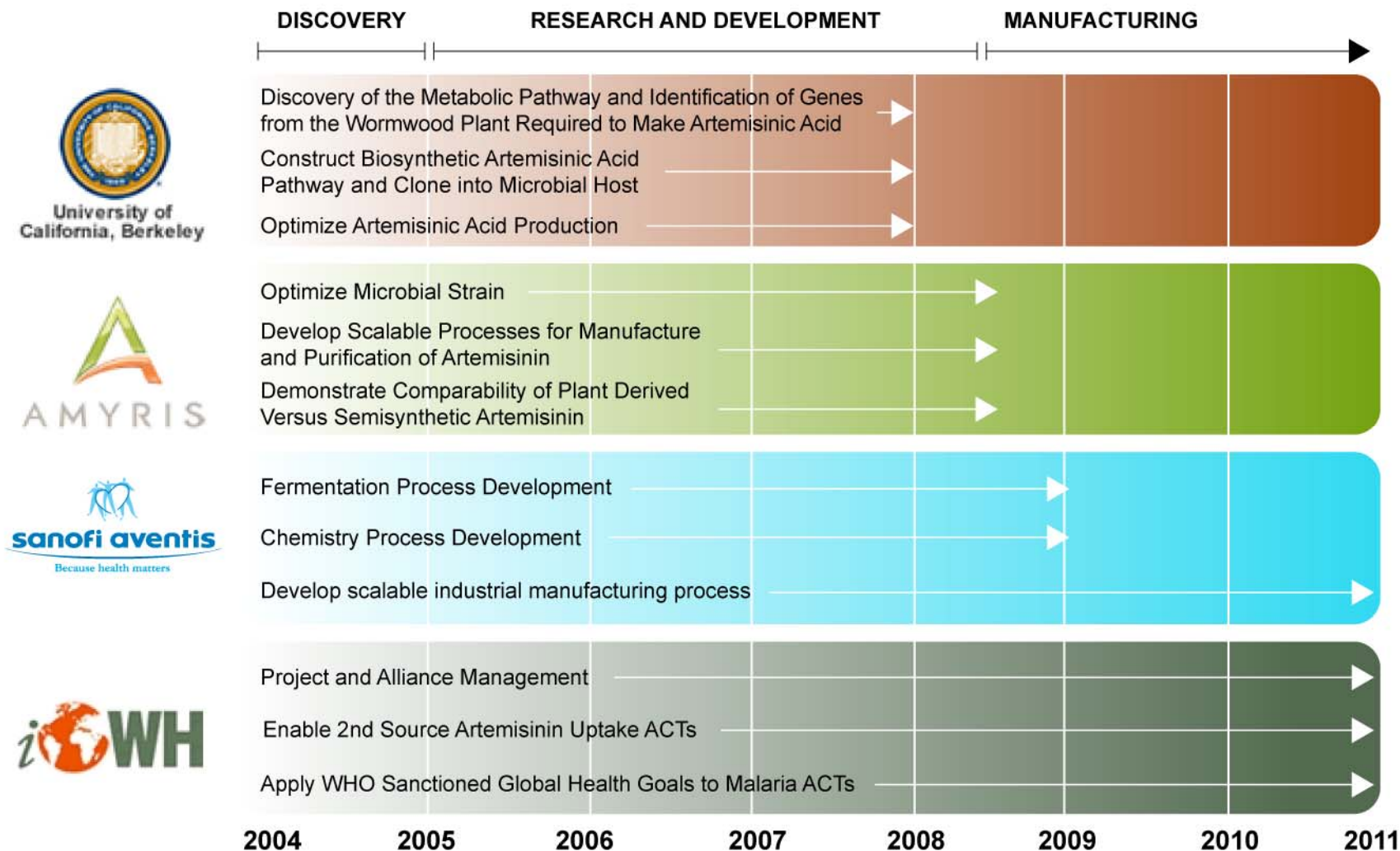


A **Second Source** Supplements & Stabilizes the Artemisinin Supply Chain



Controlled Process

The Partnership



Development of Supply Chain Strategy



Manufacturing Partnership

- Select manufacturing partner to scale up & produce cGMP semi-synthetic artemisinin
- Achieve artemisinin cost target for maximum impact on market dynamics

Supply Chain Strategy

- Identify a commercial partner who can sell to ACT makers who support public health and social responsibility goals
- Ideal commercial partner must have production capacity, commitment to malaria (ACT product), and philanthropic intent

Access

- Decrease ACT price (pass cost savings to customer)

The Artemisinin Enterprise

- **The Artemisinin Enterprise** comprises three complementary scientific projects funded by the BMGF whose aim is to improve artemisinin production technologies
 - *The Institute for OneWorld Health, Amyris Biotechnologies, The University of California Berkeley, and sanofi-aventis: **Semisynthetic artemisinin through fermentation***
 - *University of York, Centre for Novel Agricultural Products: **Yield improvement of artemisia annua seeds through fast track breeding***
 - *Medicines for Malaria Venture: **A new class of synthetic peroxides through drug discovery and research for improved extraction technologies***

Thank You

