GHIT-PDPs WEBINAR SERIES

February 2nd, 2022
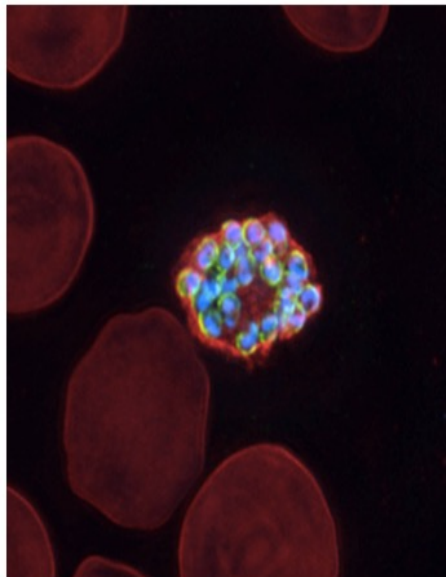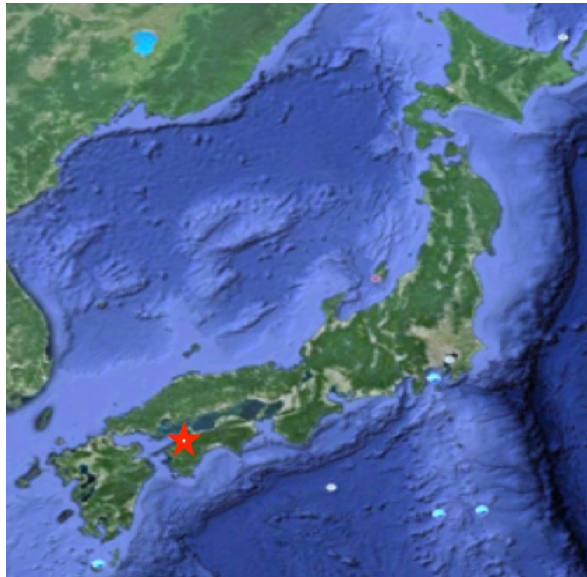
GHIT Fund — Global Health Innovative Technology Fund

FIND ▶▶▶ Diagnosis for all

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愛媛大学 EHIME UNIVERSITY

PROS
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Innovation through partnership with PDPs

Outline

1. Overview of our partnerships

    1) How the partnership started?

    2) How the partnerships with PDPs started?

    3) How the partnerships with PDPs advanced?

2. Goal settings on global health research in academia

3. Summary: Partnership with PDPs

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3. Summary: Partnership with PDPs

How the partnership started?

	Projects	Ehime U: Role	Partners: Role	Funders
1990-	**Rodent malaria model** **TBV candidate discovery**	•**Gene cloning** •mAbs •**Bioassay**	•No Partner	科研費 KAKENHI
1996-	*Plasmodium vivax* **Identify 1st TBV antigen**	•**Gene cloning** •**Bioassay**	•**NIAID**: Protein •**Mahidol U**: Field-based Bioassay	•**1997-99 TDR/WHO**

TBV: Malaria transmission-blocking vaccine

Our goal settings
Scientific achievements

Malaria Genome
in 2002

Innovative Protein Synthesis Technology
(**WGCFS**: **W**heat **G**erm **C**ell-**F**ree **S**ystem)

愛媛大学 EHIME UNIVERSITY

CFS CellFree Sciences

Suitable for malaria protein expression

WGCFS

Wheat seed
Endosperm (83%)
Bran (15%)
Germ (2%)

• Extract: Ribosome, tRNA, TFs
• mRNA

• Substrates: AAs, ATP, GTP

Stable translation for 2 weeks

(Endo & Sawasaki. Curr Opin Biotech, 2006)
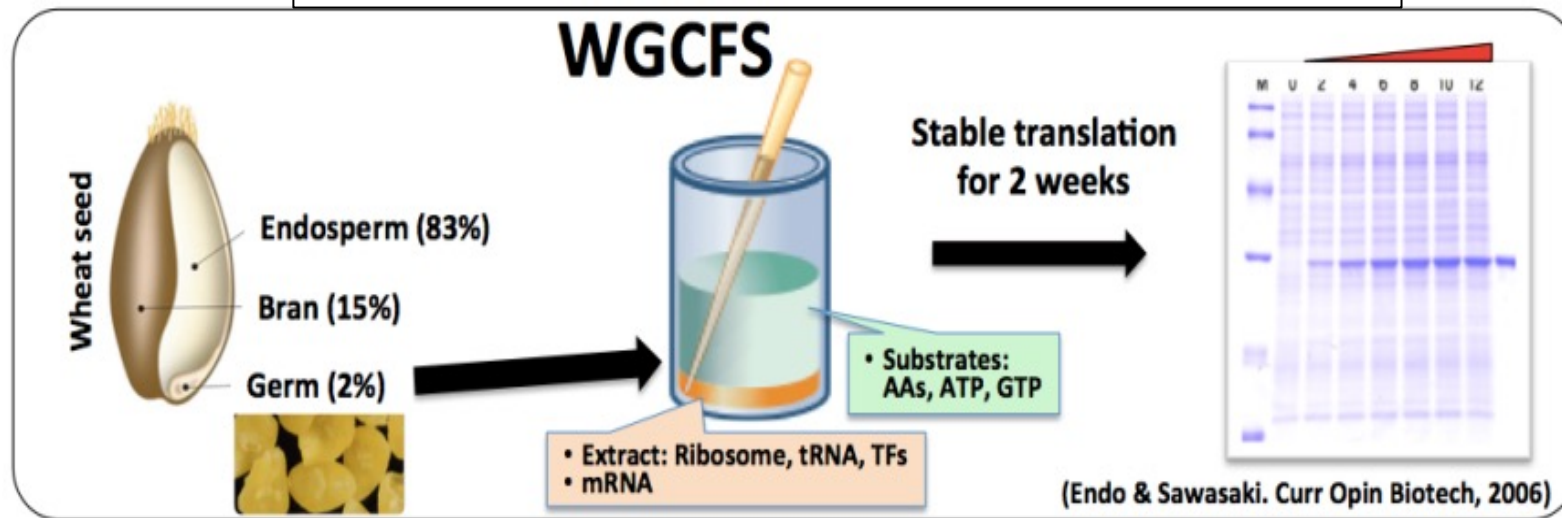
How the partnerships with PDPs started?

Vaccine Projects

		Ehime U: Role	Partners: Role (PDPs)	Funders
2003-	*P. falciparum* Blood-stage vac. discovery	•Protein (WGCFS) •Bioassay	•WEHI: Gene KO	•2008-11 BMGF
2010-	*P. falciparum* TBV discovery	•Protein (WGCFS)	•NIAID: Bioassay	•2010- PATH-MVI
2014-	*P. falciparum* Novel TBV development	•Protein (WGCFS) •Bioassay	•PATH-MVI: Project mgmt., Bioassay	•2014-GHIT-PDP

Diagnostic Project

		Ehime U: Role	Partners: Role (PDPs)	Funders
2015-	*P. vivax* Hypnozoite diagnostics development	•Protein (WGCFS) •HT-immunoassay	•WEHI: Project mgmt., Cohort sample, antibody measurement, data analysis •CFS: WGCFS large scale production •FIND: Develop TPP, Technology selection for future POC diagnostics	•2015-GHIT-TRP •2017-FIND

Our goal settings
Scientific achievement to Product development
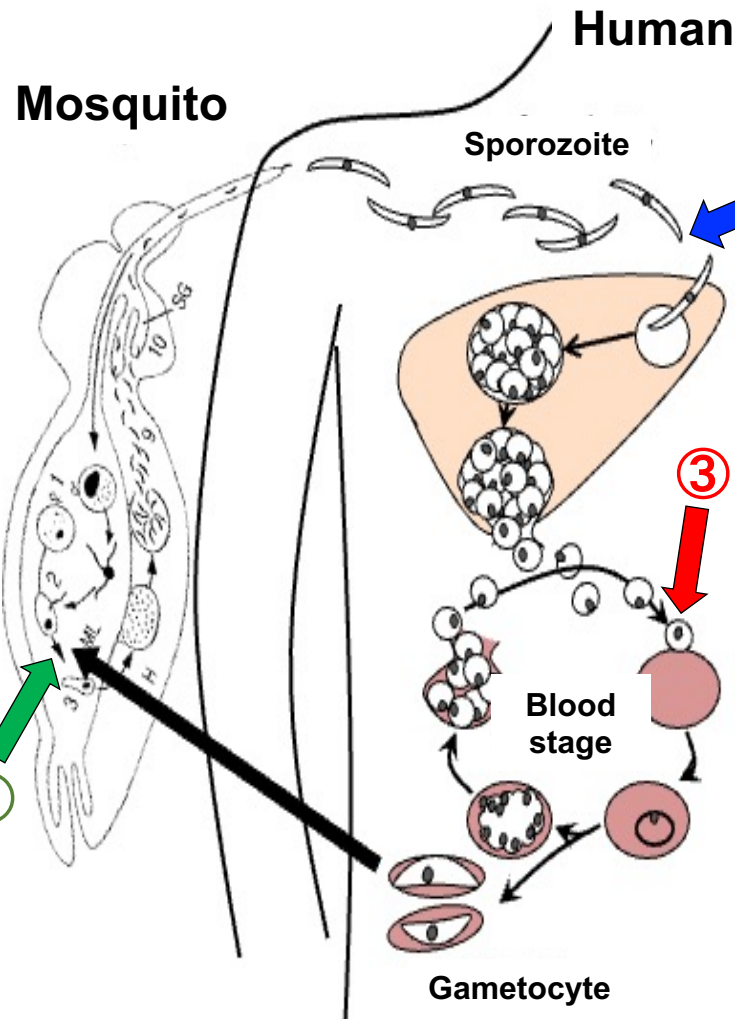
Ref. Longley et al., Nat Med 26:741-749, 2020

How the partnerships with PDPs advanced?

Malaria vaccine GHIT-funded projects

GHIT / Fund
Global Health Innovative Technology Fund

Human

Mosquito

Sporozoite

② (blue arrow)

③ (red arrow)

Blood stage

① (green arrow)

Gametocyte

Our roles in the partnerships
Scientific expertise

①Transmission-blocking vaccine

		Ehime U: Role	Partners: Role (PDPs)
2017-	*P. falciparum* TBV domain discovery	•Protein (WGCFS) •Bioassay	•PATH-MVI: Project mgmt., Platform selection, Bioassay
2020-	*P. falciparum* TBV development	•Bioassay	•PATH: Project mgmt., Preclin. develop. •Sumitomo: Adjuvant production

②Pre-erythrocytic vaccine

		Ehime U: Role	Partners: Role (PDPs)
2021-	*P. falciparum* Novel pre-erythr. vac.	•Bioassay	•PATH:Project mgmt vaccine •Sumitomo: Adjuvant, nonclinical study

③Blood-stage vaccine

		Ehime U: Role	Partners: Role (PDPs)
2019-	*P. falciparum* Novel blood-stage vac.	•Protein (WGCFS) •Bioassay	•EVI: Project mgmt., Adjuvant selection •iBET: Antigen production
2021-	*P. falciparum* Placental Malaria vac. development	•Protein (WGCFS) •HT-immunoassay	•EVI: Project mgmt., clinical •Inserm: Vaccine •U Copenhagen: Preclinical •GRAS: Clinical study •Noguchi/IRD: Field study

Please visit https://www.ghitfund.org/investment/portfolio/en.
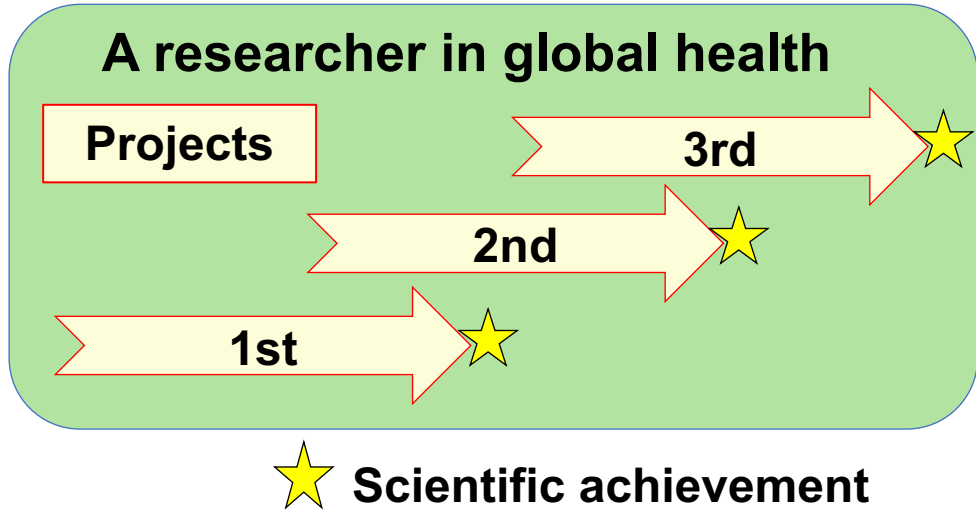
Outline

Goal settings on global health research

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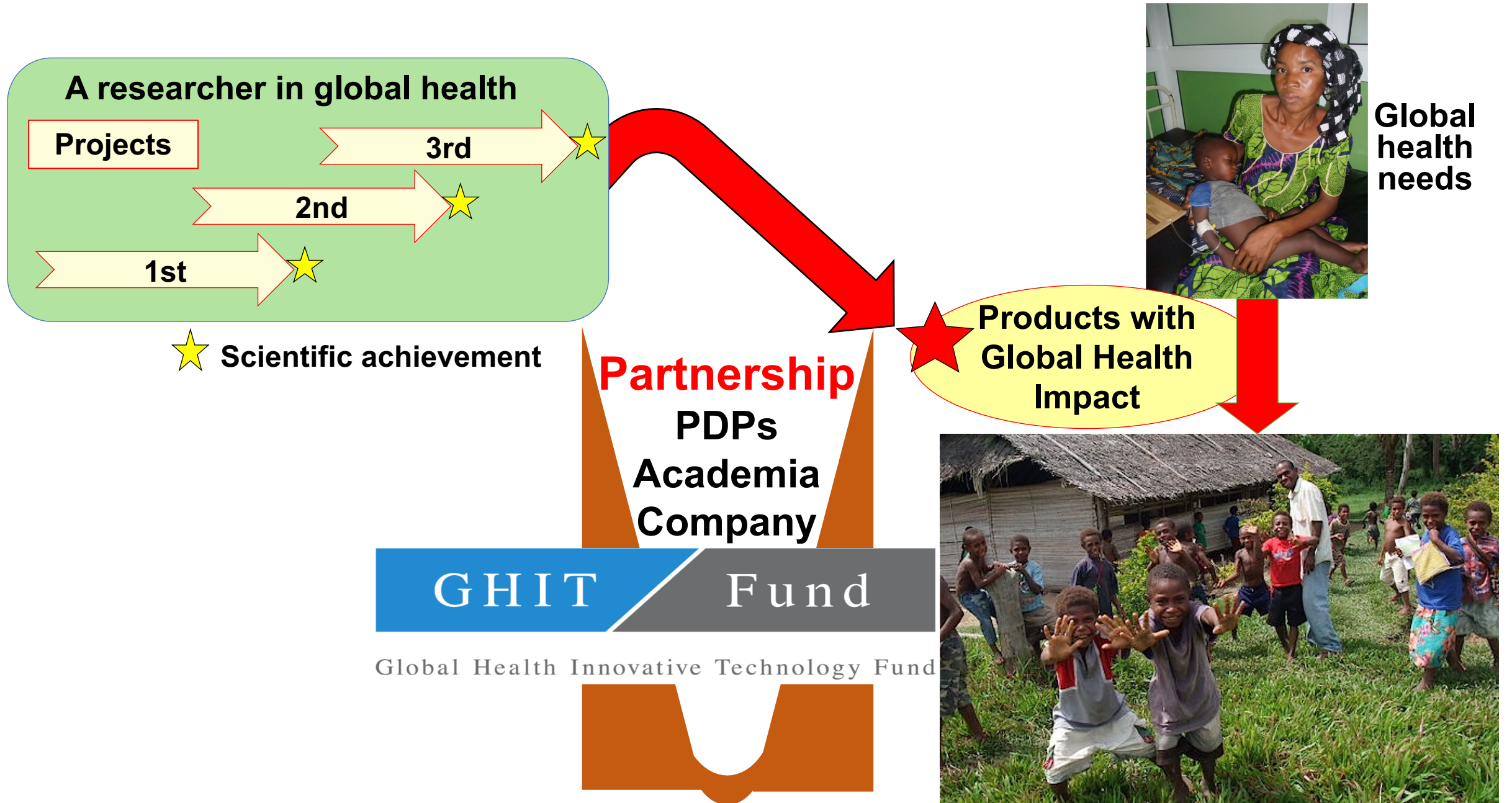
A researcher in global health

Malaria vaccine projects

3: Optimization

2: Validation

1: Target discov.

⭐ **Scientific achievement**

Global health needs

Products with Global Health Impact

"GAP" for example:
- Lack of budget to progress toward pre-clinical development
- No idea how to contact PDPs
- Risk of policy change in the partners even after the project progressed
- Etc.

Death Valley

Goal settings on global health research

Outline

Summary: Partnership with PDPs

Q1. How did we first learn about PDPs?
   a) **PATH-MVI**: since malaria TBV consortium started in 2000
   b) **FIND**: introduced by our collaborator in the *P. vivax* hypnozoite Dx. project
   c) **EVI**: met and started discussion at the GHIT Annual Partners Meeting 2016

Q2. What were the merits/impacts to us by the projects with PDPs?
   "Product development" became a visible goal of our research activities.

Q3. Lessons learned and challenges from the partnerships
   a) Proceed basic science research towards product development
   b) Establish mutually complementary relationship with the partners
   c) Most importantly, establishment of trustiness through project activities

Q4. How these lessons can be implemented in future projects with PDPs?
   a) Get ideas for the basic science research which will be useful for the future product development
   b) Continue to seek the best mix of partners with complementary expertise for future projects