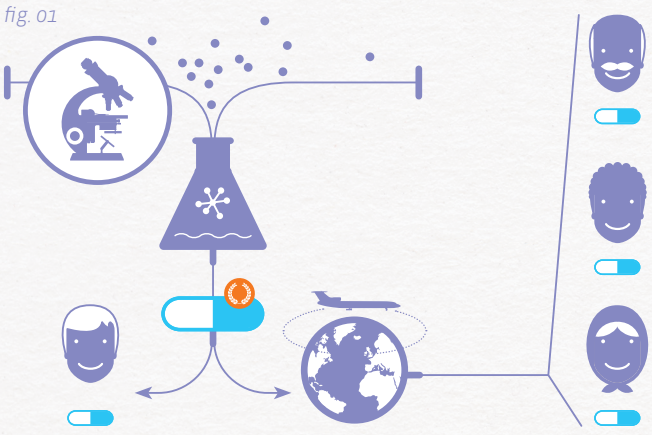
Challenge **#1**

Drug Design and Discovery

Help to find better compounds to treat both major and rare diseases, including those that continue to inflict misery and premature death in developing countries.

fig. 01

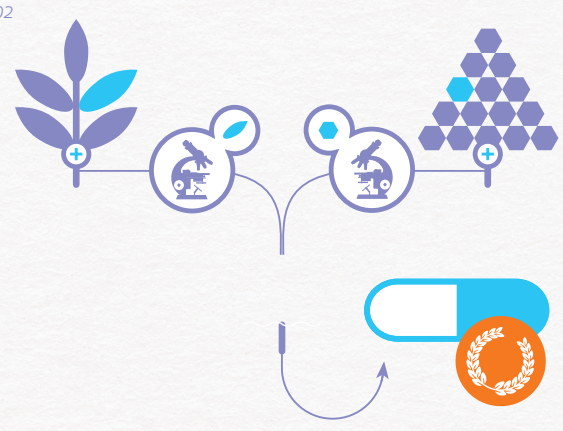


Challenge **#2**

Natural Products

Help to isolate and identify the active components of traditional and herbal remedies, and to turn them into safer and more effective drugs.

fig. 02

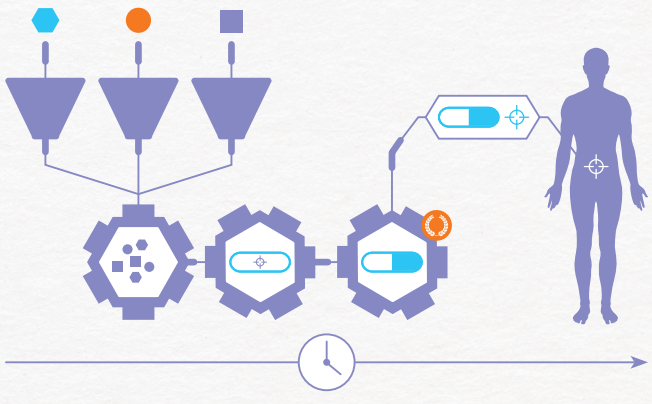


Challenge **#3**

Formulation Design and Pharmaceutical Technology

Help to develop smart systems and materials for delivering and targeting drugs more effectively and safely at an affordable cost.

fig. 03



Challenge **#4**

PK/PD and Systems Pharmacology

Help to apply mathematical modelling to understanding and predicting the fate and effects of drugs in the body for the selection of rational dosage regimens.

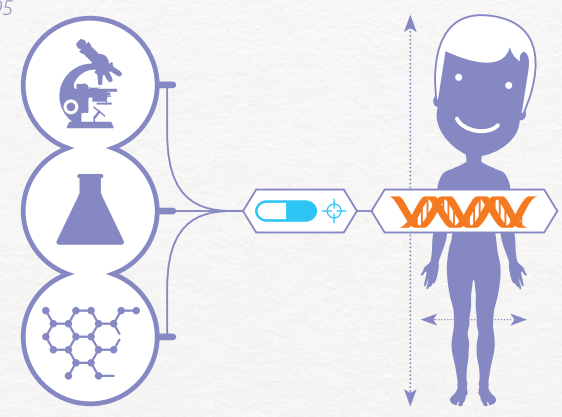
fig. 04

Challenge **#5**

Translational Research and Personalised Medicines

Help to bridge the gap between bench and bedside to bring better drugs to the patient, and to realise tailoring of drug therapy to the needs of the individual patient.

fig. 05



Challenge **#6**

Biotechnology

Help to create exciting new medicines of the future based on proteins, nucleic acids and stem cell systems.

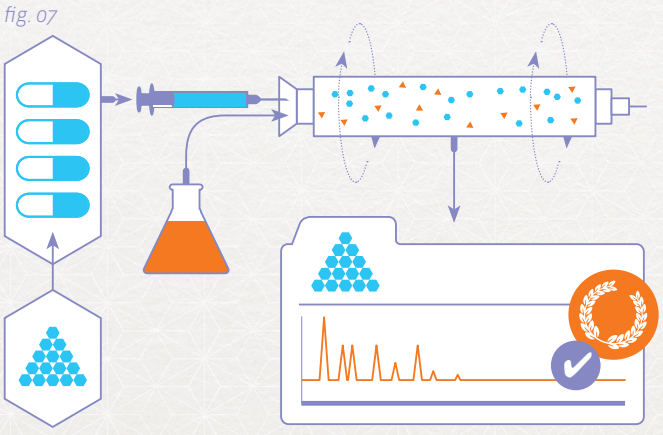
fig. 06

Challenge **#7**

Analytical Sciences and Quality Control

Help to ensure the purity and reproducibility of medicinal products and their ingredients.

fig. 07

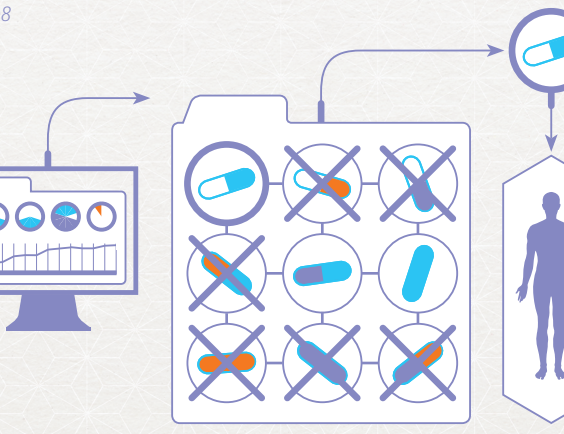


Challenge **#8**

Regulatory Science

Help to safeguard public health through critical appraisal of the safety and efficacy of new medicines.

fig. 08

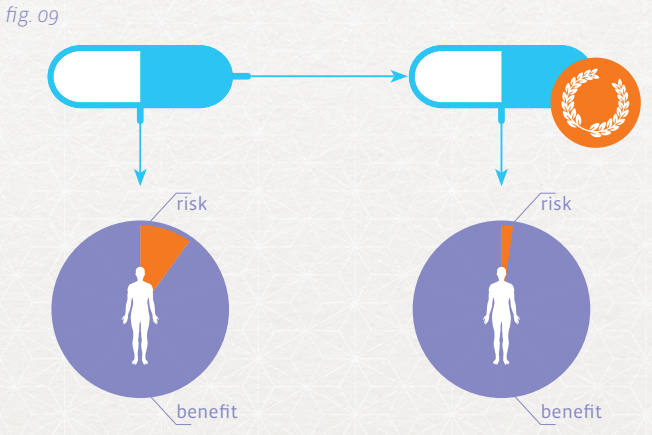


Challenge **#9**

Pharmacoeconomics

Help to improve the benefit-to-risk ratio of new therapies relative to current standards of patient care.

fig. 09



Advances in the *pharmaceutical sciences* over the past 50 years have contributed to public health by:

- Moving from description to mechanistic prediction
- Targeting for specificity of action
- Building 'druggability' features into drug design
- Optimising drugs, drug products and dosage regimens for patients through biopharmaceutics tools and PK/PD modelling
- Building quality and reproducibility into the manufacture of drug products
- Ensuring regulation reflects scientific developments
- Delivering better medicines, including generics, to patients

The ever-pressing need to make medicines even safer while ensuring that development is efficient and cost-effective means that the 'science of medicines' will be as important in the future as it has been over the past 50 years.

Will YOU be part of this future?

Changing the world by translating science into practice

Fifty years ago there were no effective medicines for the treatment of high blood pressure, the management of peptic ulcers often required surgery, and women had no reliable means of birth control. That was then.

Now, when pharmaceutical scientists look back, they can be proud of their achievements in bringing improvements to health. These developments span from the initial concept of a medicine and the selection of candidate compounds ('drug discovery') through laboratory and clinical assessment ('drug development') and approval by regulatory authorities, to the monitoring of clinical usage.

Effective translation of science into practice is the key to success in turning a molecule into a safe and effective medicine. In this flyer the biggest challenges are listed.

Recently, members of the Board of Pharmaceutical Sciences of FIP commissioned an article based on the opinions of influential pharmaceutical scientists from around the world to identify the main conceptual developments in their areas of research over the past 50 years.
Go to *www.fip.org/publications* to read that article.

Will YOU be part of the future?

Changing the world by translating science into practice

The International Pharmaceutical Federation (FIP) is the federation of more than 120 national organisations of pharmacists and pharmaceutical scientists worldwide. FIP has adopted as one of its three main strategic objectives the advancement of pharmaceutical sciences. This ambitious goal is being achieved through the work of 10 special interest groups (SIGs) led by the Board of Pharmaceutical Sciences, which develops projects and initiatives to help FIP and its member organisations truly advance the pharmaceutical sciences on a global level.

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www.fip.org/pharmaceutical_sciences

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Access and read this document, and see how YOU can be part of the future success of the pharmaceutical sciences!