HOW WE DISCOVER OUR INNOVATIVE MEDICINES

Boehringer Ingelheim

Compounds

10,000

200

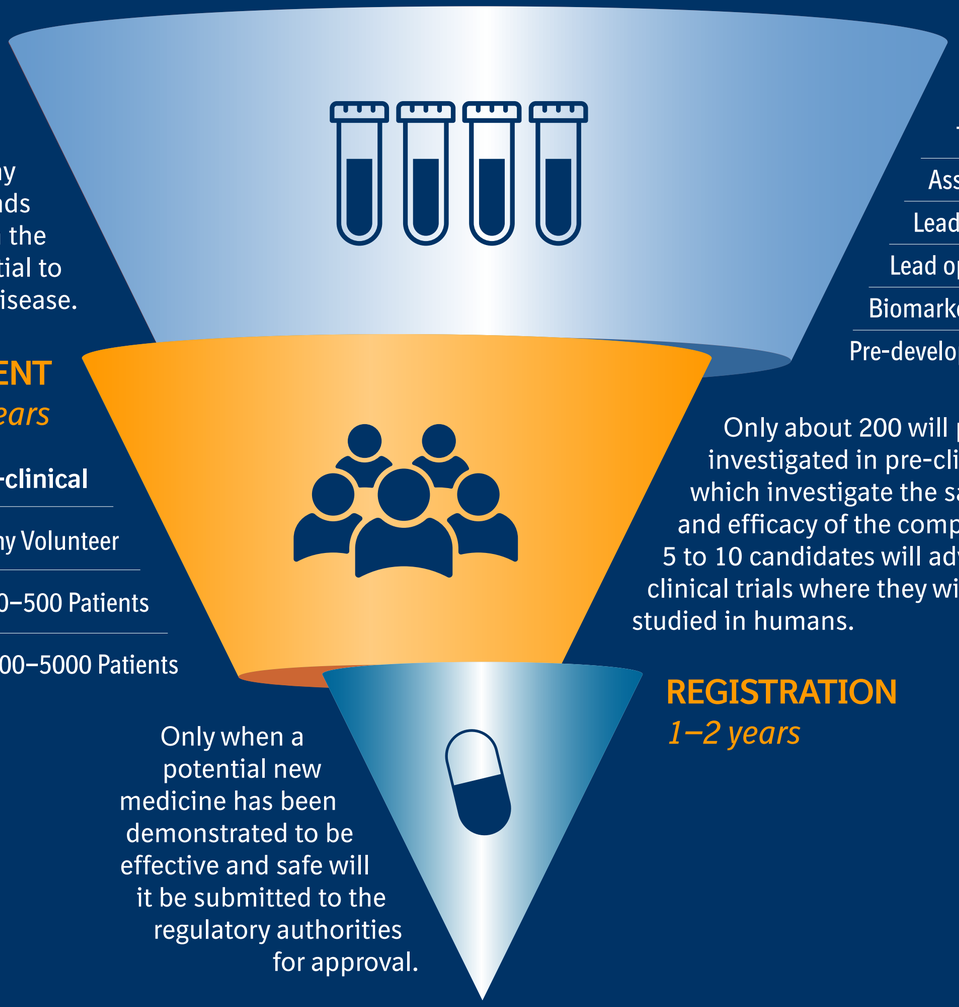
10

5

01

Years

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15



DISCOVERY RESEARCH
4–5 years

Researchers identify ‘targets’ such as genes or proteins involved in diseases and then search or ‘screen’ many thousands of potential compounds or ‘candidates’ that may act on the target and have the potential to change the course of disease.

- Target identification & validation
- Assay development
- Lead identification
- Lead optimization
- Biomarker development
- Pre-development

DEVELOPMENT
6–8 years

Only about 200 will progress to be investigated in pre-clinical trials which investigate the safety and efficacy of the compounds. 5 to 10 candidates will advance to clinical trials where they will be studied in humans.

- **Pre-clinical**
- **Phase 1** 20–100 Healthy Volunteer
- **Phase 2** 100–500 Patients
- **Phase 3** 1000–5000 Patients

REGISTRATION
1–2 years

Only when a potential new medicine has been demonstrated to be effective and safe will it be submitted to the regulatory authorities for approval.

REGULATORY APPROVAL

1–2 in 10,000

On average, only one to two of every 10,000 substances synthesized in laboratories will be investigated in late-stage clinical trials and finally made available to patients.[2]

12–15 YEARS

It takes, on average, about 12–15 years from discovery to the approved medication and requires a significant investment.[1]

REFERENCES:

1. DiMasi et al, Journal of Health Economics, January 2016

2. The Pharmaceutical Industry in Figures. European Federation of Pharmaceutical Industries. Key Data 2018 https://www.efpia.eu/media/361960/efpia-pharmafigures2018_v07-hq.pdf