Utrecht University

CBG MEB MEDICINES EVALUATION BOARD

Working on biomarkers – research landscape and evidence generation

Introduction to the topic

Marjon Pasmooij

What is a biomarker?

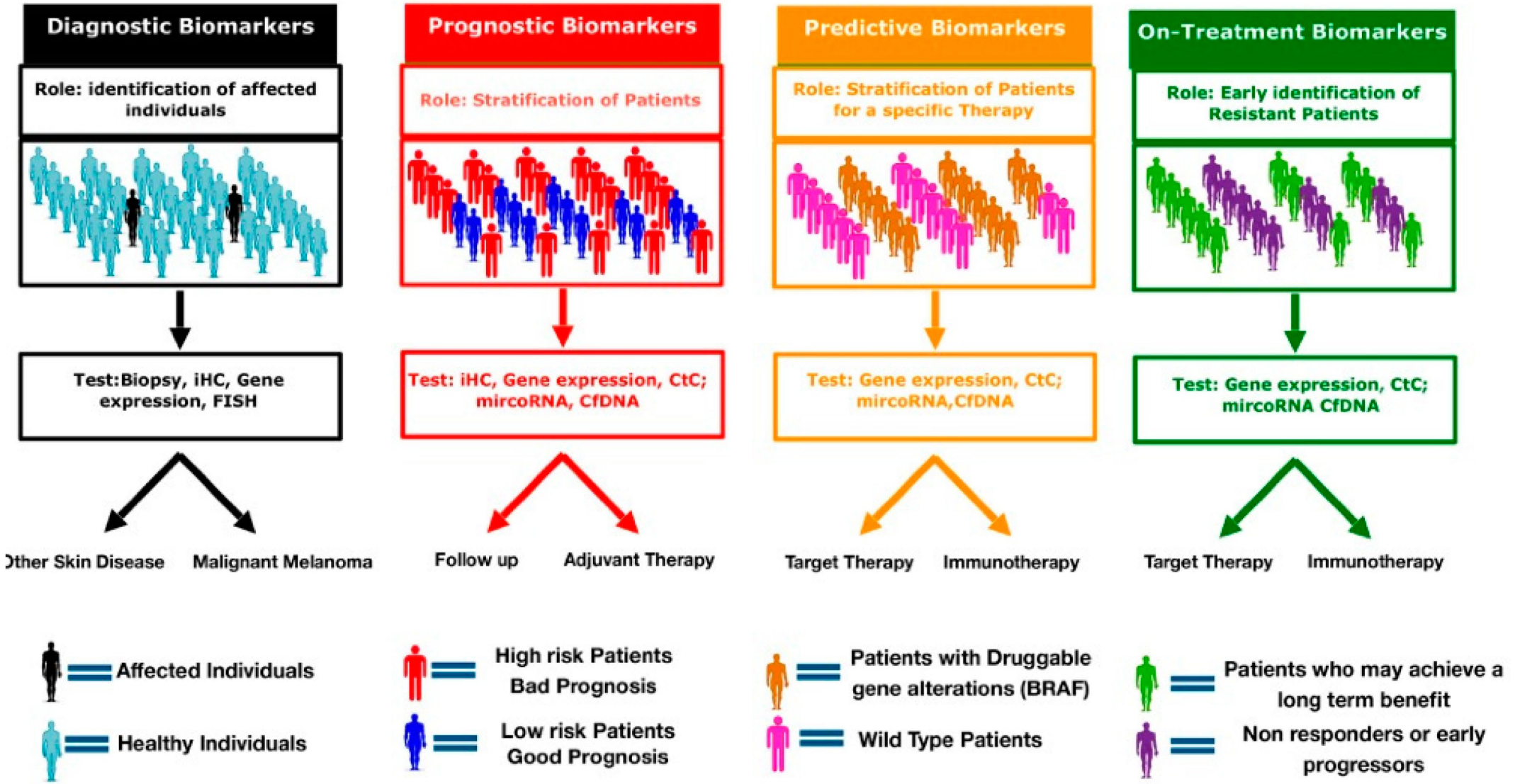
- An objective and quantifiable measure of a physiological process, pathological process or response to a treatment (excluding measurements of how an individual feels or functions).

Biomarker category	Description
Diagnostic	BM for detection and/or confirmation of a disease or identification of a subtype of disease
Monitoring	BM measured serially status detection of a disease/medical condition
Prognostic	BM to identify likelihood of a clinical event
Predictive	BM identifying patients who are more likely to experience a (un)favorable effect after exposure to a MP
PD/Response	BM to show that a biological response has occurred in an individual after exposure to a MP
Safety	BM measured before/after exposure to MP to indicate likelihood, presence, extent of toxicity as an AE
Susceptibility/risk	BM indicates the potential for developing a disease

BM biomarker, *MP* medicinal product, *AE* adverse event, *PD* pharmacodynamic

Zander and Engelbergs, 2024, Allergo Journal International

Applications of Biomarkers



Pilla et al., 2020, Cancers

Regulatory Science Research Needs (2025)

Focus area: Biomarkers				
NT14	Research on predictive biomarkers for patient-tailored treatment of frequent diseases	1. Develop studies for discovering, confirming and validating biomarkers (including multi-modal biomarkers, and AI-based predictive biomarkers) that may predict response to a medicine, with a focus on frequent or chronic diseases such as cardiovascular diseases (A; E; F)	• Biomarkers • Personalised medicine • Cardiovascular diseases	Human medicine

[Regulatory science research needs | European Medicines Agency (EMA)]

Research on Biomarkers

Development of a biomarker for a specific Context of Use

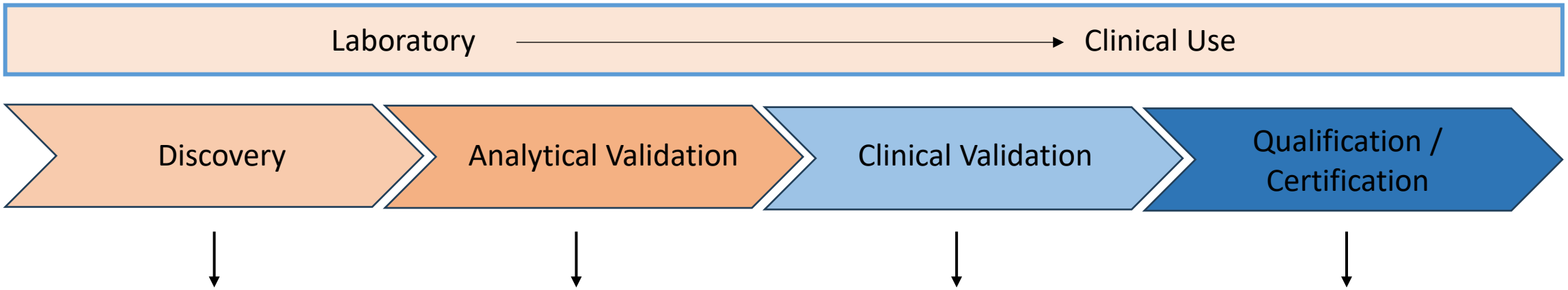
How can we facilitate biomarker drug development? What are challenges in the development? What works well? Learnings from specific biomarker use cases.

Research into the use of biomarkers in regulatory-decision making

How can we facilitate biomarker drug development by investigating e.g. what the role was in regulatory-decision making, the most important discussion points were during qualification, how cut-off values are set, etc.

Sharing of experiences and knowledge in European Platform for Regulatory Science Research with aim to advance the research

Biomarker Development



- ✓ Standardized sample source
- ✓ Bioinformatics
- ✓ Identification/POC
- ✓ Pilot Validation
- ✓ Detection Method

- ✓ Context of Use
- ✓ Establish acceptability of performance characteristics
- ✓ Precision, sensitivity, accuracy, dynamic range

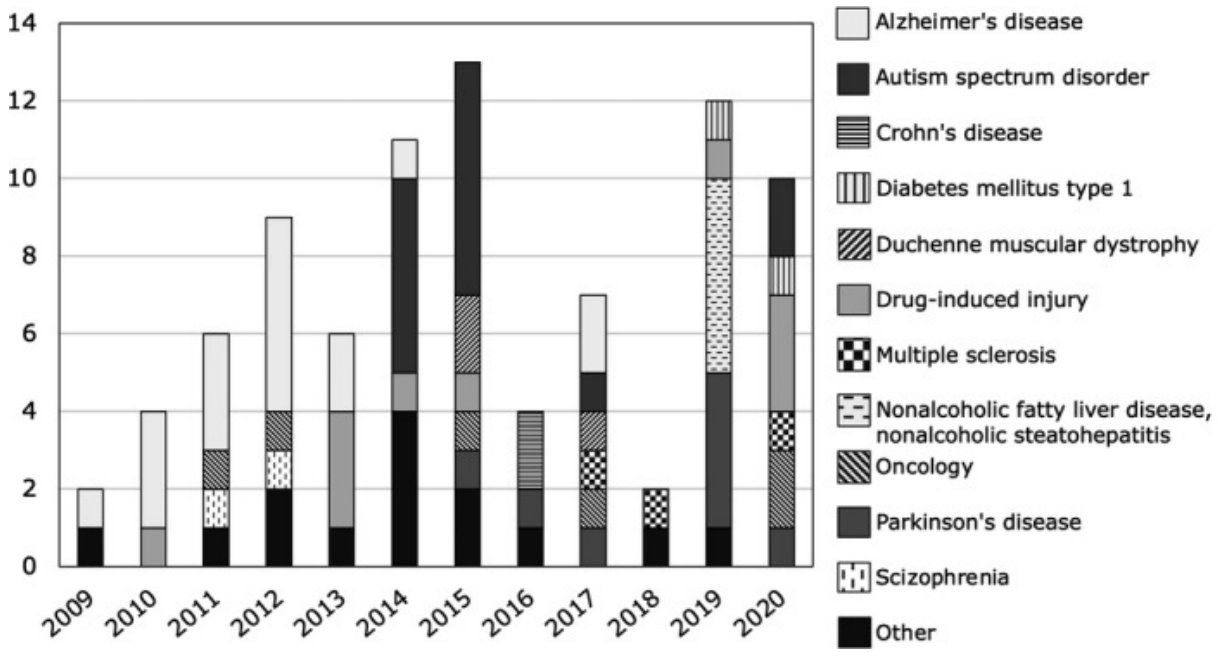
- ✓ Large, prospective or retrospective clinicalstudies
- ✓ Context of Use
- ✓ Evaluate overall utility for clinical practice and drug development

- ✓ EMA qualification
- ✓ Notified Body certification
- ✓ Within Context of use, biomarker provides reliable application and allows specific interpretation

Adapted from NIH, National Institute of Neurological Disorders and Stroke

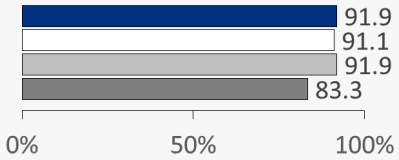
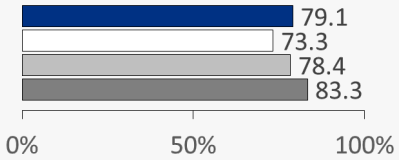
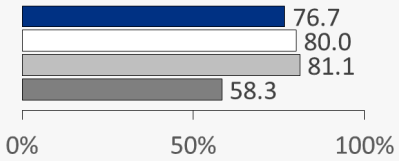
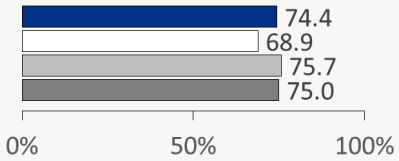
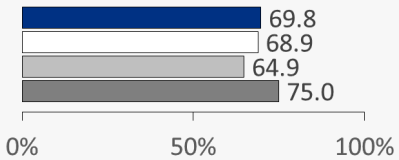
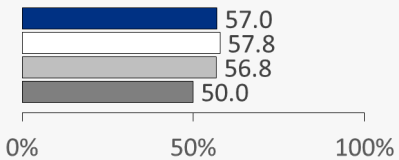
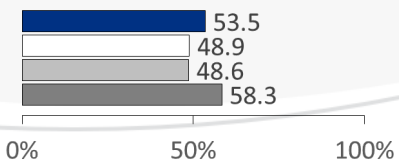
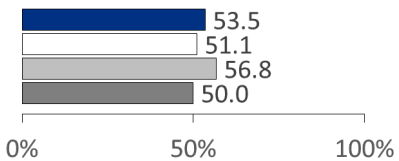
Biomarker Qualification

*…a voluntary **pathway** allowing developers of **innovative methods** and **tools** to request a **qualification** by European regulators of these **instruments** for a **specific intended use** in the context of research and development into pharmaceuticals.*



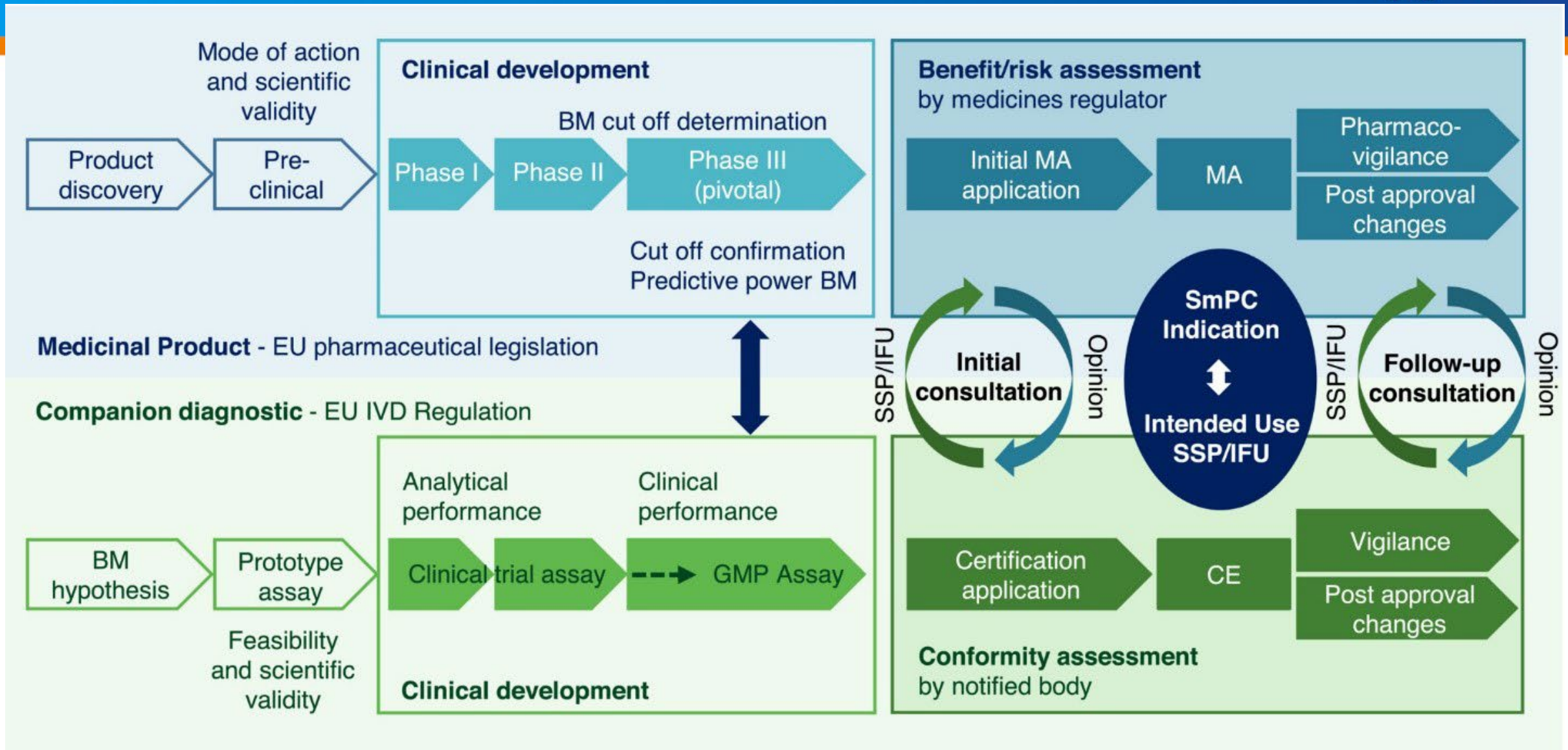
Bakker et al., 2022, Clin Pharmacol Ther

[Qualification of novel methodologies for medicine development | European Medicines Agency (EMA)]

Category		Description
Biomarker properties		Issues related to the properties of the biomarker, including sensitivity and specificity, thresholds and cut-off values
General study design		Issues related to the design of the studies that are part of the qualification exercise, such as study type and population
Assay validity		Issues related to the proposed test, assay, or methodology to measure the biomarker
Evidence		Issues related to the evidence provided to support the claims with respect to the biomarker itself (and not the assay)
Data analysis/ statistics		Issues related to analysis of data that are used to support the claims, including statistical methods
Anchoring		Issues related to anchoring the biomarker with a gold standard or clinically relevant outcome
Rationale		Issues related to the choice of biomarker or biological rationale
Context of use		Issues related to the definition of the context of use

Bakker et al., 2022, Clin Pharmacol Ther

IVDR



Session outline

14:10	**Working on biomarkers – research landscape and evidence generation (80 min)**	
	Co-moderators: Marjon Pasmooij & Günter Waxenecker	
	Introduction and topic mapping *Marjon Pasmooij*	**10 min**
	Researcher perspective on state, gaps and opportunities *Chantal Mathieu*	**15 min**
	Open discussion and questions *All participants invited*	**55 min**

Development of a biomarker for a specific Context of Use

Research into the use of biomarkers in regulatory-decision making

CBG MEB

COLLEGE TER BEOORDELING VAN GENEESMIDDELEN

GOEDE MEDICIJNEN GOED GEBRUIKT

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