



Innovation@Bayer

////// Advancing life by creating the
leading solutions in health and
nutrition

BIOTUESDAYS - March, 5th 2019

Rachel Rama



Our Business Areas

Pharmaceuticals



// Prescription drugs

Consumer Health



// Over-the-counter medicines,
dietary supplements,
dermatology products,
foot care and sunscreen

Crop Science



// Innovative chemical & biological
crop protection, seeds & traits,
digital technologies & services

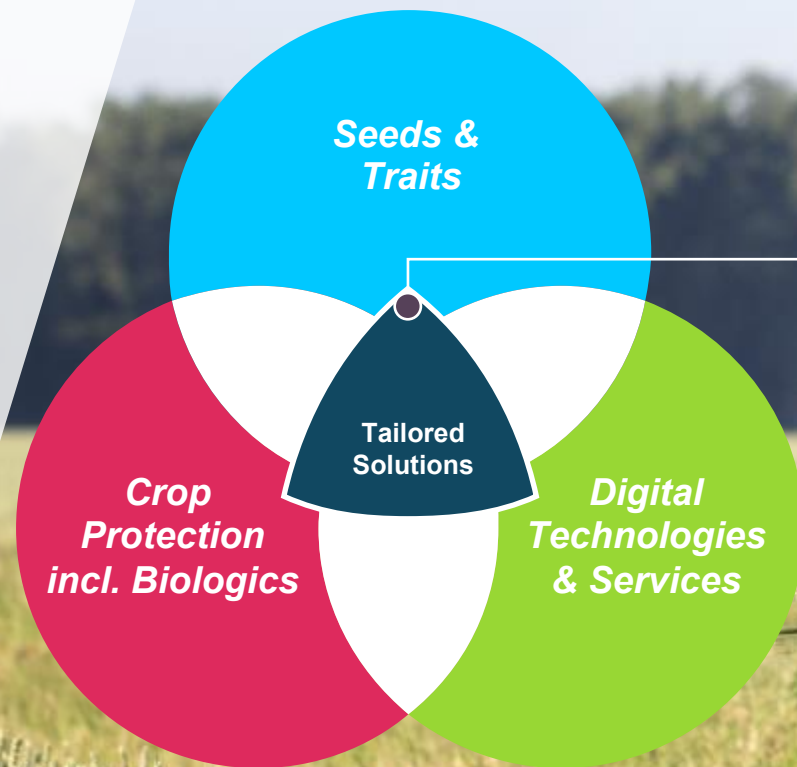
// Animal Health



Tailored solutions to address farmers' individual needs and challenges

////// We know growers...

- // ...make approximately **40 big decisions** every season
- // ...want to grow the **best seed varieties**, and minimize **pests, diseases & weeds**
- // ...want to balance **societal, economic & environmental** needs



A combination of **products, technologies and services** to constitute an individualized solution with **unique value** for our customers.

> Continuous innovation to drive environmentally sustainable, profitable, high-quality crops

The convergence of biology and technology combined with the potential to leverage data in completely new dimensions is changing the game in fundamental ways...

Age of *Biology*

Microbiome

Stem Cells

Gene Editing

Cognitive Science

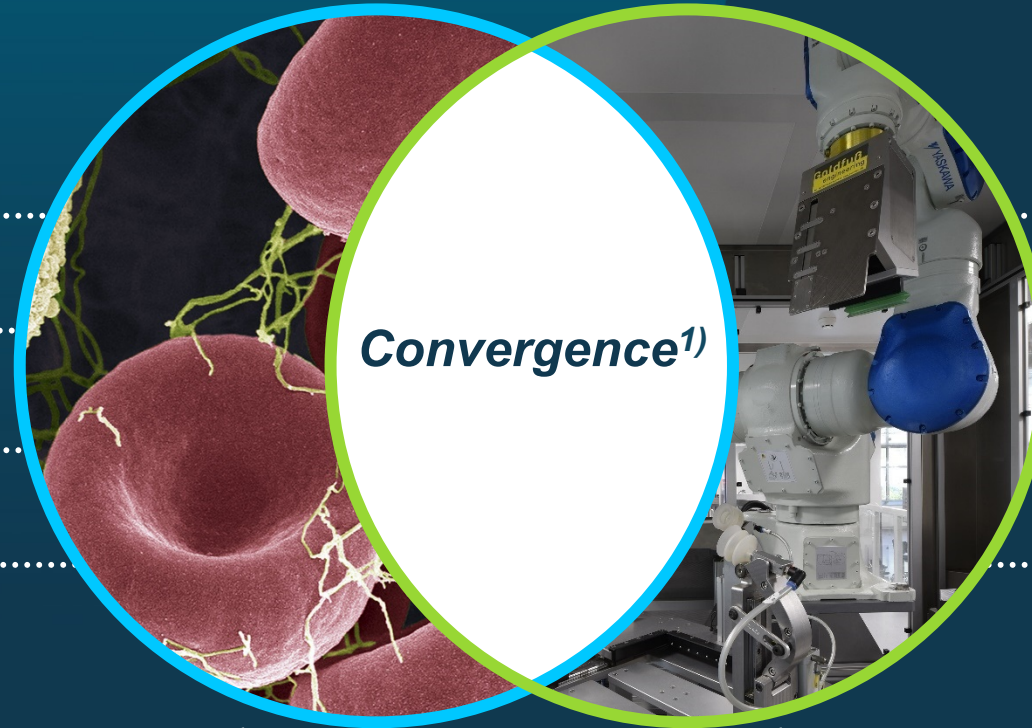
⋮
Systems
Biology

⋮
Regenerative
Engineering

⋮
Synthetic
biology

⋮
Imaging

⋮
Nano
technology



Age of *Technology*

..... Artificial Intelligence

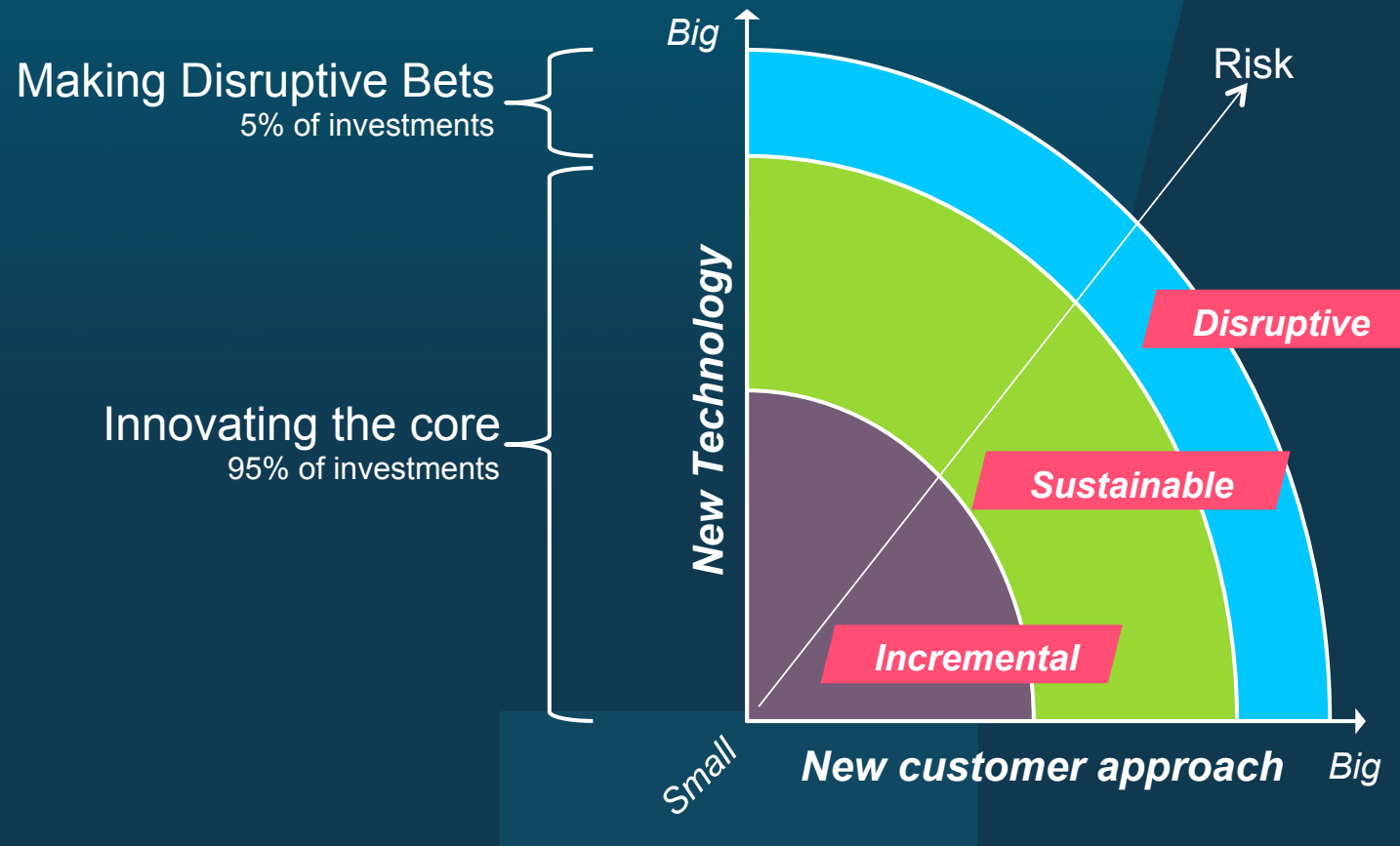
..... Sensors/Optics

..... Blockchain

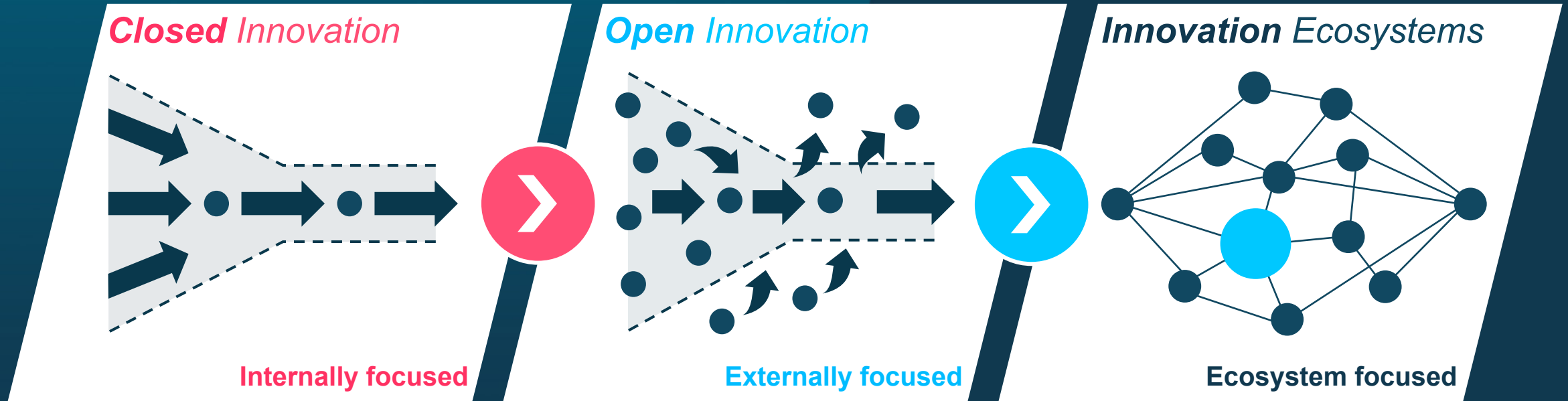
..... Robotics



To harness these opportunities we need to drive Innovation across three horizons



...and expand our Open Innovation approach towards Innovation ecosystems



*“Increasingly, a large industrial company needs to think about itself as a **node in a much broader network**, and it needs “competition” not simply about how we **build market share** but about how we **capture innovation share** from across a very broad ecosystem”*

Gary Hamel



With our global network of

LifeHubs

we integrate in Leading Innovation Hot Spots Catalyzing Innovation through Collaboration



Life
Hub
Boston



Life
Hub
Berlin



Life
Hub
Osaka



Life
Hub
California



Life
Hub
Lyon



Life
Hub
Singapore



With our **G4Ag** program we offer support to startups in the field of digital agriculture

G4Ag



Mentoring & Coaching



Office Space



Networking



Partnerships



The G4Ag program aims to incubate startups in close relation to a R&D challenge





Data Science is accelerating our activities along the R&D Value Chain in key areas of our business – selected examples

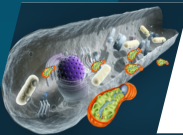
Research



Machine Learning
for Chemical Synthesis

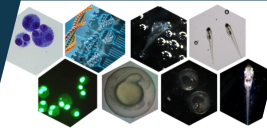


Biological screening
assisted by computational
technologies

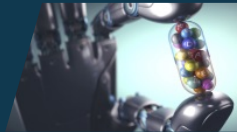


Target centric platform

Development



Simulation
& modeling for human
tox and ecotox

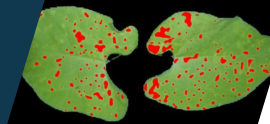


Artificial Intelligence
for Drug Design



Digital biomarkers
(plant stress)

Marketed Products

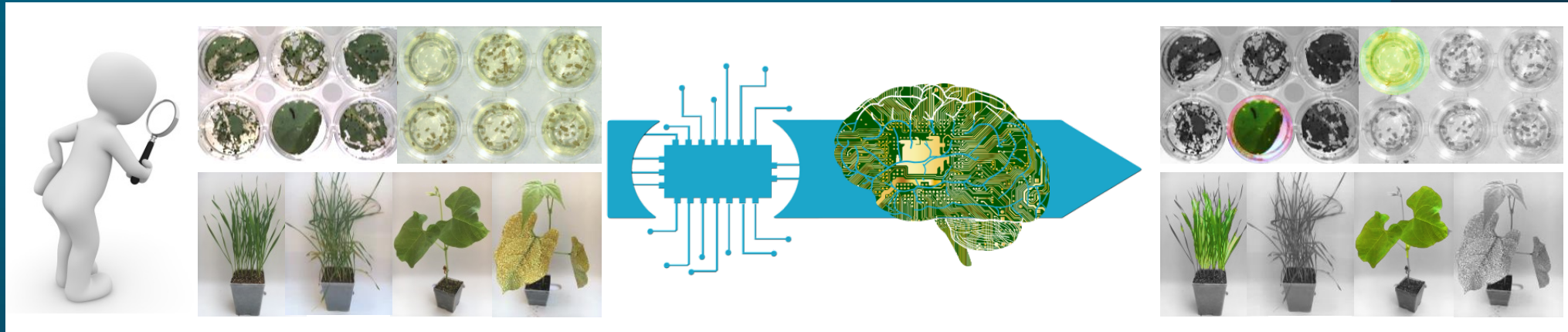


Phenotyping: to support
identification of the more
potent solutions for farmers



Digital farming and
Precision application

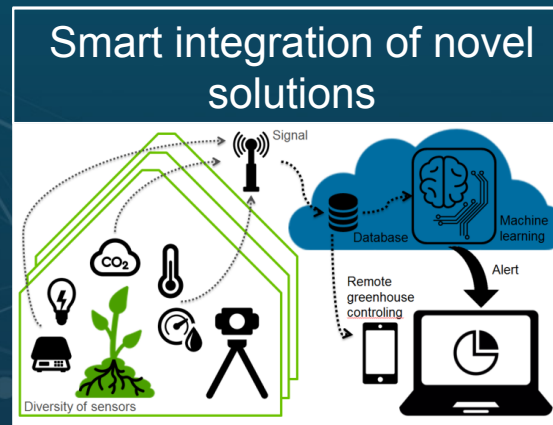
Smart solutions for farmers need to be identified rapidly!



Human screen for insect survival, disease contamination or plant health.

Computer vision and machine learning algorithms.

Automatic selection of most interesting phenotypes.



**Digital phenotyping
as a key enabler**



Find out more at
innovate.bayer.com

Connecting with the brightest
minds to co-create the leading
solutions in health and nutrition