Proof of Concept Examples

How €30k can move research to lab validation and beyond!

Characteristics of Proof of Concept

"Killer Experiment"

Fast (≤8 months)

Generate **go / no-go decision**

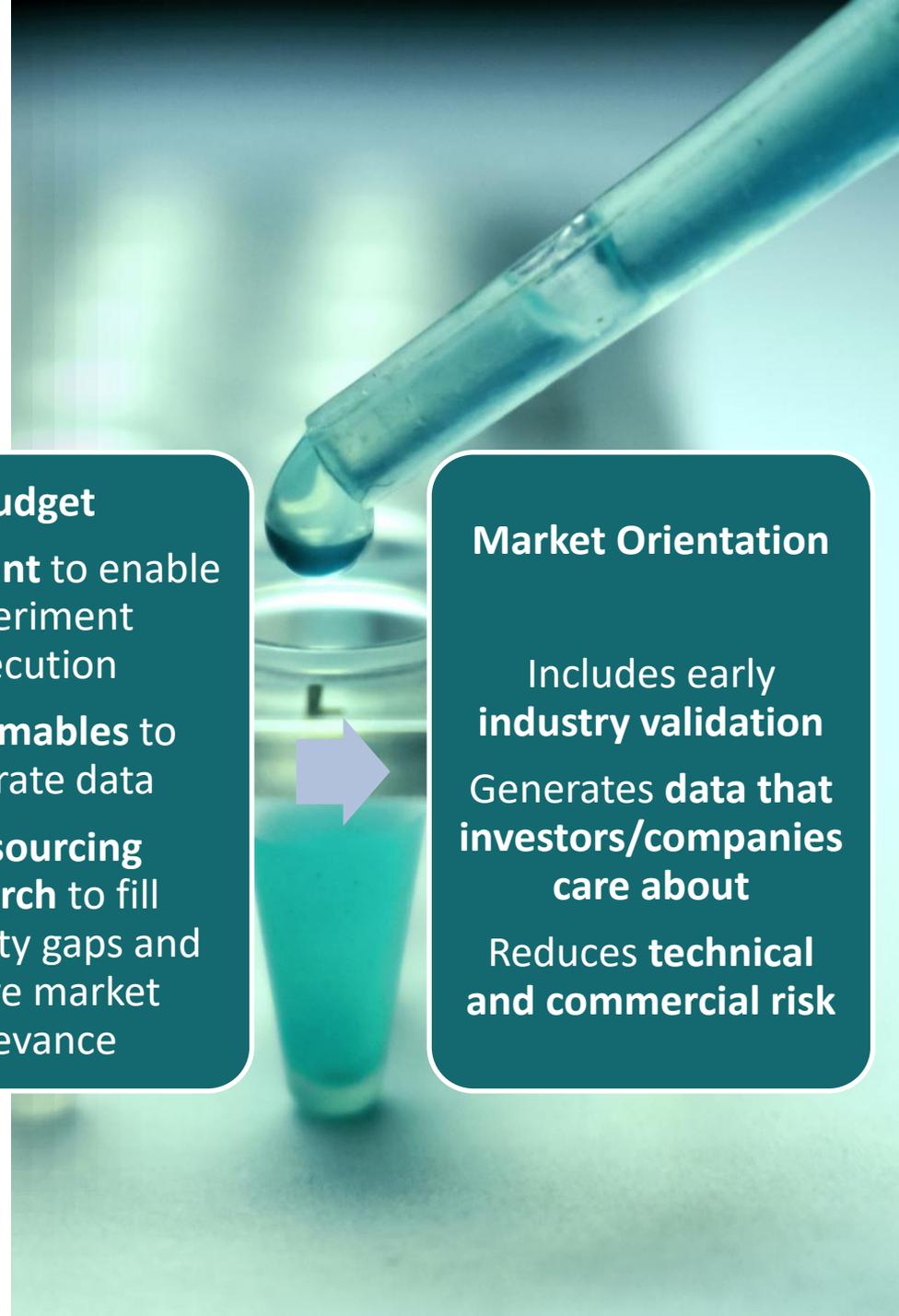Directly linked to **market application**

Budget

Equipment to enable experiment execution

Consumables to generate data

Outsourcing research to fill capability gaps and ensure market relevance

Market Orientation

Includes early **industry validation**

Generates **data that investors/companies care about**

Reduces **technical and commercial risk**

Example 1 – Food Biotechnology Enzyme

OBJECTIVE - Demonstrate that a novel enzyme improves yield / texture in a real food system (e.g., dairy, bakery)

PROBLEM

Plant-based dairy products suffer from:

✓ Poor texture
✓ Protein precipitation
✓ Need for additives

SOLUTION

Enzyme that improves texture:

✓ Improves solubility of protein
✓ Reduces grainy texture
✓ Works at low temperature

Indicative Steps

Select enzyme candidate

Define application

Lab-scale trials vs benchmark enzyme

Optimize conditions

Pilot-scale validation in relevant food matrix

Measure KPIs

Stability and shelf-life testing

Feasibility assessment

Indicative budget distribution

Activity	Cost category	Budget in €
Bioreactor access / analytical tools	Equipment	Up to 8k
Substrates, reagents, assay kits	Consumables	Up to 12k
Enzyme characterization / market analysis	Outsourced research	Up to 10k

Expected Outcome of PoC

- 10–20% process efficiency improvement
- Proof of scalability potential
- Clear industrial use case

Industrial Partner Role

Food manufacturer (e.g., dairy/bakery company)

Provides:
- real processing conditions
- validation environment

Example 2 – Biological Plant Protection

OBJECTIVE: Prove that a biological agent reduces pest/disease impact under controlled and semi-field conditions.

PROBLEM

Farmers rely on chemical pesticides that are:

✓ increasingly restricted
✓ environmentally harmful
✓ losing effectiveness due to resistance

SOLUTION

Beneficial soil microorganism that

✓ **naturally inhibits** plant pathogens
✓ creates a **natural biological defense** against crop diseases

Indicative Steps

Select microbial/biological agent

Identify target pest/pathogen

In vitro efficacy tests (growth inhibition, pathogen suppression)

Greenhouse trials (treated vs untreated plants)

Dose-response optimization

Small-scale field simulation or extended greenhouse trials

Environmental stability and application method testing

Indicative budget distribution

Activity	Cost category	Budget in €
Growth chambers, spraying systems	Equipment	Up to 7k
Culture media, plants, soil, assay kits	Consumables	Up to 13k
Regulatory pathway and environmental impact study	Outsourced research	Up to 10k

Expected Outcome

- **30% reduction in disease/pest impact**
- **Evidence of consistency and safety**
- **Data supporting regulatory feasibility**

Industrial Partner Role

Agrochemical or agri-biotech company

Provides:
- **Target crops and pathogens**
- **Insight into regulatory constraints**
- **Route to commercialization**

Example 3 – Early Disease Detection method

OBJECTIVE: Demonstrate early detection capability with higher sensitivity/speed than current methods

PROBLEM

Many serious diseases are **detected too late**

✓ Late diagnosis
✓ Expensive diagnostic procedures
✓ Slow laboratory diagnostics

SOLUTION

identifies **disease biomarkers in blood samples**

✓ earlier disease detection
✓ faster results
✓ lower diagnostic costs
✓ scalable screening programs

Indicative Steps

Identify biomarker

Develop detection concept

Prototype development

Calibration with known samples

Validation with real biological samples

Compare with benchmark diagnostics

Robustness testing (repeatability, false positives/negatives)

Usability assessment

Indicative budget distribution

Activity	Cost category	Budget in €
Sensor prototyping tools, detection devices	Equipment	Up to 10k
Reagents, biological samples	Consumables	up to 10k
Clinical validation support and IP landscape	Outsourced research	Up to 10k

Expected Outcome

- **Earlier detection vs standard methods (e.g., days earlier or higher sensitivity)**
- **Functional prototype (TRL 3–4)**
- **Defined pathway to clinical deployment**

Industrial Partner Role

Diagnostics company / med-tech firm

Provides:
- **Access to real samples**
- **Validation environment**
- **Regulatory and market insight**

Example 4 – AI systems to reduce GHG in food supply chains

OBJECTIVE: Show that an AI model can reduce greenhouse gas emissions through optimized logistics, sourcing, or processing

PROBLEM

Food supply chains generate **significant (GHG) emissions**

✓ Complex supply chains
✓ Difficult emission tracking
✓ Regulatory pressure
✓ Lack of decision-support tools

SOLUTION

AI-based modelling system

✓ automated carbon footprint monitoring
✓ identification of emission "hotspots"
✓ operational optimisation
✓ compliance with sustainability reporting requirements

Indicative Steps

Define use case (e.g., transport optimization, energy use)

Collect historical data

Develop baseline model (current emissions)

Build AI optimization model

Simulate interventions (routing, sourcing changes)

Compare baseline vs optimized scenarios

Pilot implementation with real or near-real data

Validate emission reduction

Indicative budget distribution

Activity	Cost category	Budget in €
Cloud computing / servers	Equipment	Up to 5k
Datasets, software licenses	Consumables	Up to 5k
AI development support / lifecycle assessment (LCA)	Outsourced research	Up to 20k

Expected Outcome

- •10–20% reduction in GHG emissions (modeled or pilot)
- Scalable digital solution
- Strong sustainability and regulatory relevance

Industrial Partner Role

Food company / logistics provider

Provides:
- Real supply chain data
- Pilot testing environment
- Immediate business case validation

Thank you and good luck!!