



Bio-Hackathon 2025 Problem Statements

Problem 1: Natural Remedies for Stomach Ulcers

What's the Problem?

- **H. pylori** is a harmful bacteria that lives in the stomach and causes painful ulcers (sores in the stomach lining)
- Many people have H. pylori infections that don't respond to regular antibiotics anymore (antibiotic-resistant)
- Current treatments are expensive and sometimes don't work

What You Need to Design:

- **Natural remedies** using plants, herbs, or other natural ingredients
- Solutions that can kill H. pylori bacteria without harsh chemicals
- Products that people can buy without a doctor's prescription
- Remedies that stay good at room temperature (no refrigeration needed)
- Low-cost options that regular people can afford

Real-World Impact:

This could help millions of people worldwide who suffer from stomach ulcers, especially in areas where medical care is expensive or hard to access.



Problem 2: Natural Solutions for PCOS

What's the Problem?

PCOS (Polycystic Ovarian Syndrome) affects many women and causes:

- Irregular periods
- Weight gain
- Insulin resistance
- Fertility problems
- Unwanted hair growth

Current treatments often have significant side effects

Many women can't afford ongoing medical treatment

What You Need to Design:

Nutraceutical remedies (food-based medicines) using natural ingredients

- Solutions with little to no side effects
- Products made from easily available, cheap, or free natural materials
- Treatments that don't require a doctor's prescription
- Ingredients that are available year-round without special storage

Real-World Impact:

This could provide affordable, safe alternatives for women managing PCOS, especially in communities with limited healthcare access.



Problem 3: Early Heart Disease Detection Kit

What's the Problem?

- **Atherosclerosis** is when arteries get clogged with fatty deposits
- It leads to heart attacks and requires expensive
 - procedures like: Bypass surgery (rerouting blood around blocked arteries)
 - Stents (tiny tubes to keep arteries open)
- By the time symptoms appear, the disease is often advanced
- Current detection methods are expensive and require hospitals

What You Need to Design:

- **Early detection kit** that can catch the disease before it becomes serious
- **Minimally invasive** (maybe just a finger prick) or completely non-invasive
- **Home-use friendly** - people can test themselves without medical training
- **Affordable** for average families
- **Easy to interpret** results

Real-World Impact:

This could prevent heart attacks and save lives by catching heart disease early, while reducing healthcare costs for families and healthcare systems.



Key Requirements for All Solutions:

Design Requirements:

- **Complete solution** ready for prototype development
- **Detailed flowchart** showing how your solution works
- **Cost estimation** for building and testing your prototype
- **Timeline** for development and testing
- **Lab requirements** needed for testing

Success Criteria:

- **Accessible** - Available to common people
- **Affordable** - Low-cost solutions
- **Safe** - Minimal side effects
- **Practical** - Easy to use without extensive training
- **Sustainable** - Ingredients/components available long-term

Why These Problems Matter:

All problems focus on making healthcare more accessible and affordable for regular people, especially those in underserved communities. They emphasize prevention and natural solutions over expensive medical interventions.