*This is the **Foundation Combined** version — Higher Tier and Separate-only content removed.*

The immune system defends against pathogens through non-specific and specific responses.

Required Practical: Aseptic technique — culturing bacteria, testing antibiotic effectiveness.

- Non-specific: skin barrier, mucus, cilia, stomach acid, phagocytosis
- Specific: lymphocytes produce antibodies complementary to specific antigens
- Memory cells: remain after infection → rapid response on re-exposure → immunity
- Vaccination: harmless antigen → antibodies + memory cells → protection without disease
- Herd immunity: enough vaccinated → pathogen cannot spread → unvaccinated protected

Key Terms

Antibody	Specific protein binding to one antigen — produced by lymphocytes
Memory cell	Long-lived lymphocyte — enables rapid response on re-exposure

■ **Exam Tip:** Specific immune response: antigen detected → lymphocytes produce antibodies → antibodies bind antigens → memory cells remain. This sequence must be correct.