



**BIOTECHNOLOGY**

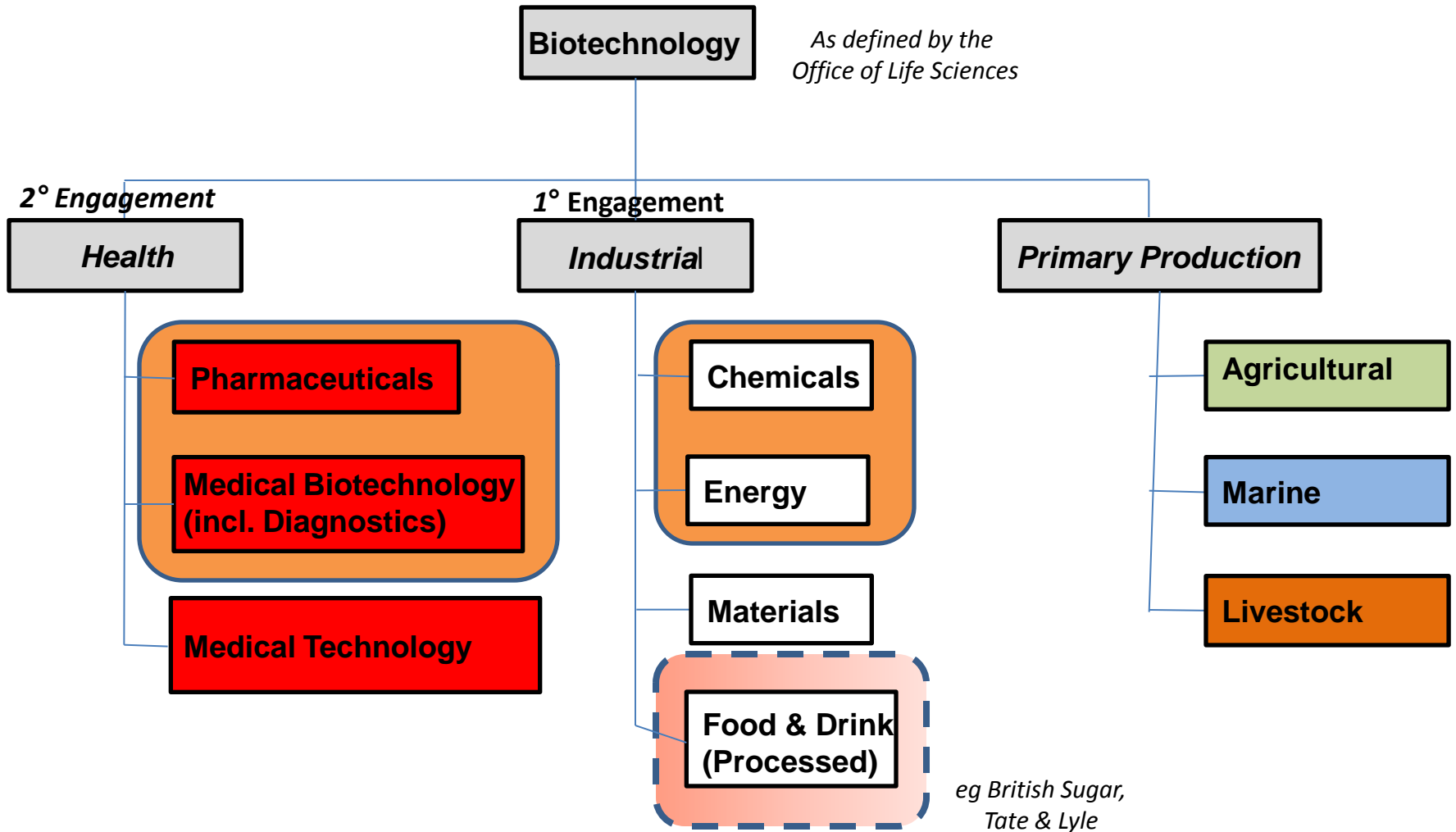
# BIOTECHNOLOGY

## What is Biotechnology?

Transforming a molecule using a biological process, into a new molecule that can be further processed and sold as a product

- Fermentation process using a “Bug”, eg Yeast
- Existing Product Markets, (examples only not the total market)
- Chemical
- Biofuels, Ethanol from Wheat
- Cosmetics, Creams
- Pharmaceutical, (levels of GMP and Sterility increased significantly)
- Antibodies for use in hospital path labs, blood analysis
- Clinical trial and Pharma toll manufacture of products
- Energy
- Anaerobic Digestion of waste, methane, electricity

# Biotechnology Sector Overview



# Sector Differentiation

- Within Biotechnology
  - Industrial Bio -- Chemical, Energy, Food
    - Very similar unit operations to Speciality Chemical Production
    - One Unit Operation make it Bio
      - Fermentation, with
      - “In pipe” and “in vessel” sterilisation
  - e.g. Manufacture of long chain protein molecules for use in cosmetics
  - Bioethanol from Wheat
  - Processing of sugar beet to crystal sugar and fermentation of the waste to produce ethanol
  - Some fall in to top tier COMAH regulations

# Sector Differentiation

- Pharma / Medical
  - Medicine for Human or a product used in Diagnostics
    - Vaccines, eg Bird Flu
    - Antibodies for use in hospital path labs in blood analysis
  - Unit operations small scale
    - Highly regulated (Orange Book, F and DA)
    - Fermentation heart of process
    - High levels of sterilisation in and out of the equipment
      - (Clean rooms)
    - Low volume, high value

# Employer Engagement

- Industrial
  - Market size
    - 2000 employees in UK
  - PSL/PSM, Corporate Partnerships, Consultancy, Business Referrals.
- Medical/Pharma
  - Corporate Partnerships, Consultancy and Business referrals.
  - LAC will provide standards and products
    - Mid 2012

# Employer Engagement

- 2012 Strategy
  - Network to continue to understand market and develop contacts
    - Conferences, cluster events
      - KTN Biotechnology event, Anaerobic Safety conference
  - Use expanded databases to secure employer visits
    - Underway, several new proposals submitted

# Provider Engagemen

- IB needs mostly met by existing Providers
  - Some technical requirements
    - Fermentation, minimal demand
    - CPI Partnership
- Medical/Pharma
  - Technical Requirements (levels III and above)
  - Leadership and Management
    - Scientific to Commercial Skills
  - Apprenticeships
    - HLA and FD's will be applicable

# Provider Engagement

- New Providers, Primarily for Med/Pharma
  - City and Islington College
  - TOPRA Regulatory Affairs
  - Lancaster University
  - Belfast Met

# Partnerships

## Centre for Process Innovation, Wilton

- Pilot plant facilities for IB clients
- National Industrial Biotech Facility
  - Significant Government funding
- Anaerobic Digestion Plant and Equipment
- One of 6 Technology Innovation Centres
  - NCC in Bristol also a TIC
- NSAPI to act as CPI Skills arm
  - Initial discussions, concluded by end Jan 2012
  - Adaptation of existing CPI training programmes
    - Significant IP opportunities for Academy