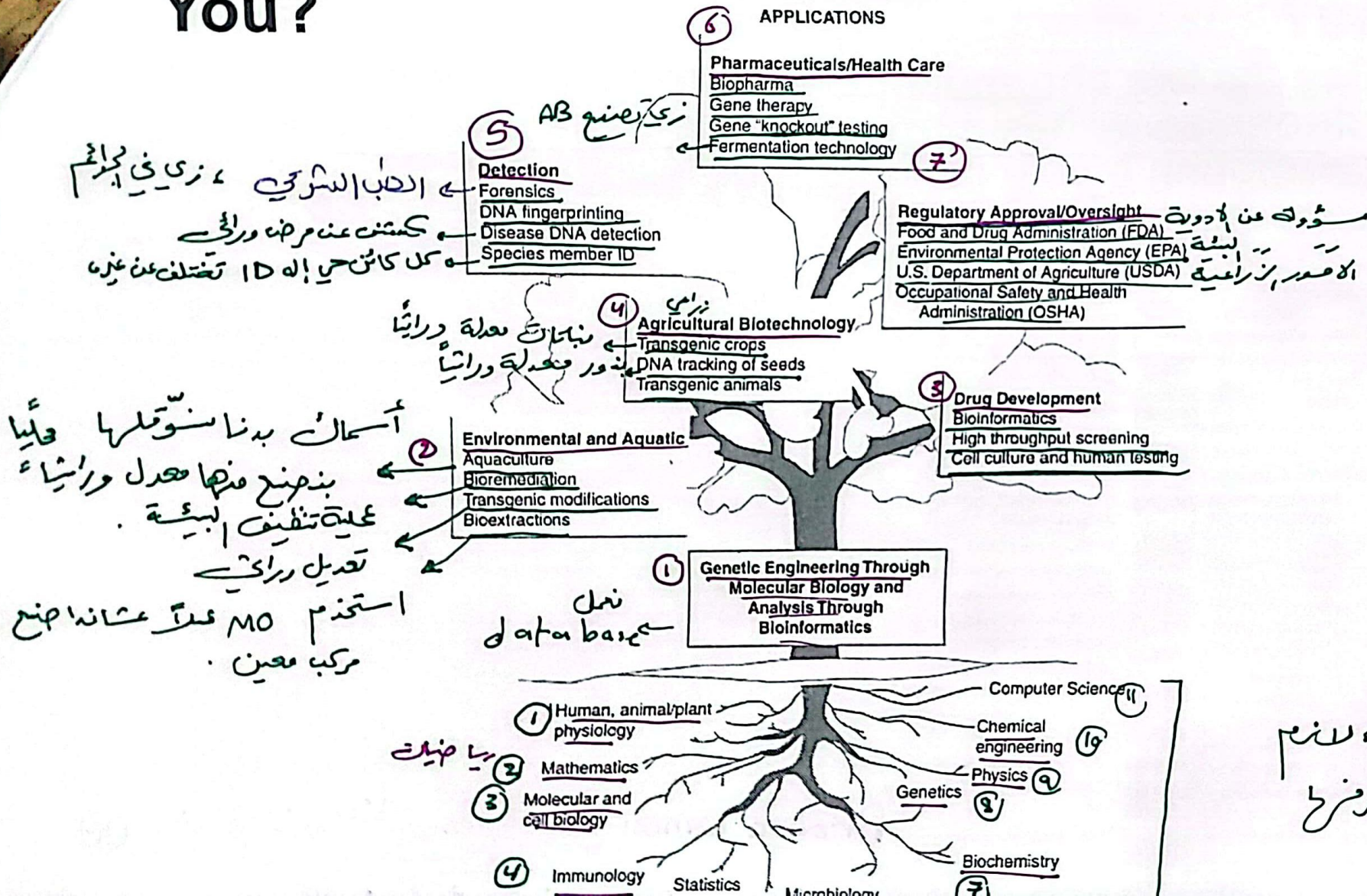


سواء كان في الطب أو الزراعة أو الصناعة
 Biotechnology هي تجميع من

Biotechnology and What Does It Mean to You?



الاستغاثات
 التي يرجع اعلمها
 لاسم نظام
 Biotechnology

الأحياء لانهم
 أعمق

الطب السريري ، زى في الجراح
 كسنت عن مرضه ورأى
 كل كائن حي له ID تختلف عن غيره
 أسماك بدنا سنوتلها ولها
 بنمى منها عدل ورأى
 عملية تنظيف البيئة
 تعديل راي
 استخدم MO على عشان اصنع
 مركب معين

نمل
 database
 ريا ضيق

Biotechnology and What Does It Mean to You?

recombinant [DNA technology] started modern biotech as an industry

موجودہ منہ
راہداریات

• Examples of applications

1. development of disease-resistant plants

تطویر نباتات سے مقاومہ للأمراض

2. food crops that produce greater yields

محاصيل تنبت بكمالات أكبر

3. "golden rice" engineered to be more nutritious

محصولات غائی پروتینات
وفیات مینات بکثر

4. genetically engineered bacteria that can degrade environmental pollutants

تتحلل

ملوکات

لکسز تقیر
modern

You?

- See the two chromosomes below and determine which chromosome has more than one gene involved in promoting breast cancer.

Chromosome 13

114 million bases

Cholesterol-lowering factor	Cataract, zonular pulverulent
Deafness, autosomal dominant and recessive	Stem-cell leukemia/lymphoma syndrome
Vohwinkel syndrome	Spastic ataxia, Charlevoix-Saguenay type
Ectodermal dysplasia	Pancreatic agenesis
Muscular dystrophy, limb-girdle, type 2C	Maturity Onset Diabetes of the Young, type IV
• Breast cancer, early onset	Enuresis, nocturnal
Pancreatic cancer	Dementia, familial British
Disrupted in B-cell neoplasia	Rieger syndrome, type 2
Leukemia, chronic lymphocytic, B-cell	X-ray sensitivity
MHC class II deficiency, group B	Rhabdomyosarcoma, alveolar
Hyperornithinemia	Lung cancer, non small-cell
Hyperammonemia	Spinocerebellar ataxia
Homocitrullinemia	Ceroid-lipofuscinosis, neuronal
Serotonin receptor	Microcoria, congenital
Retinoblastoma	Schizophrenia susceptibility
Osteosarcoma	Xeroderma pigmentosum, group G
Bladder cancer	Coagulation Factor VIII deficiency
Pinealoma with bilateral Retinoblastoma	Oguchi disease
Wilson disease	Stargardt disease, autosomal dominant
Postaxial polydactyly, type A2	Coagulation Factor X deficiency
Hirschsprung disease	Breast cancer, ductal
Propionicacidemia, types I or pccA	
Holoprosencephaly	
Bile acid malabsorption, primary	

Chromosome 21

50 million bases

Coxsackie and adenovirus receptor	Myeloproliferative syndrome, transient
Amyloidosis cerebroarterial, Dutch type	Leukemia, transient, of Down Syndrome
Alzheimer disease, APP-related	Enterokinase deficiency
Schizophrenia, chronic	Multiple carboxylase deficiency
Usher syndrome, autosomal recessive	T-cell lymphoma invasion and metastasis
Amyotrophic lateral sclerosis	Mycobacterial infection, atypical
Oligomycin sensitivity	Down syndrome (critical region)
Jervell and Lange-Nielsen syndrome	Autoimmune polyglandular disease, type I
Long QT syndrome	Bethlem myopathy
Down syndrome cell adhesion molecule	Epilepsy, progressive myoclonic
Homocystinuria	Holoprosencephaly, alobar
Cataract, congenital, autosomal dominant	Knobloch syndrome
Deafness, autosomal recessive	Hemolytic anemia
Myxovirus (influenza) resistance	Breast cancer
Leukemia, acute myeloid	Platelet disorder, with myeloid malignancy

*) إذا كانه عنا Genes لا Breast cancer

بناوت دكتور محمد حبيب

“Breast cancer...”

*) انبينا جوك

لما فوصت

عرفت لانه

عندها جنت

تبع breast

Cancer

عملت عليه

removal

of breast

رخصت

هناك اختلافات ...

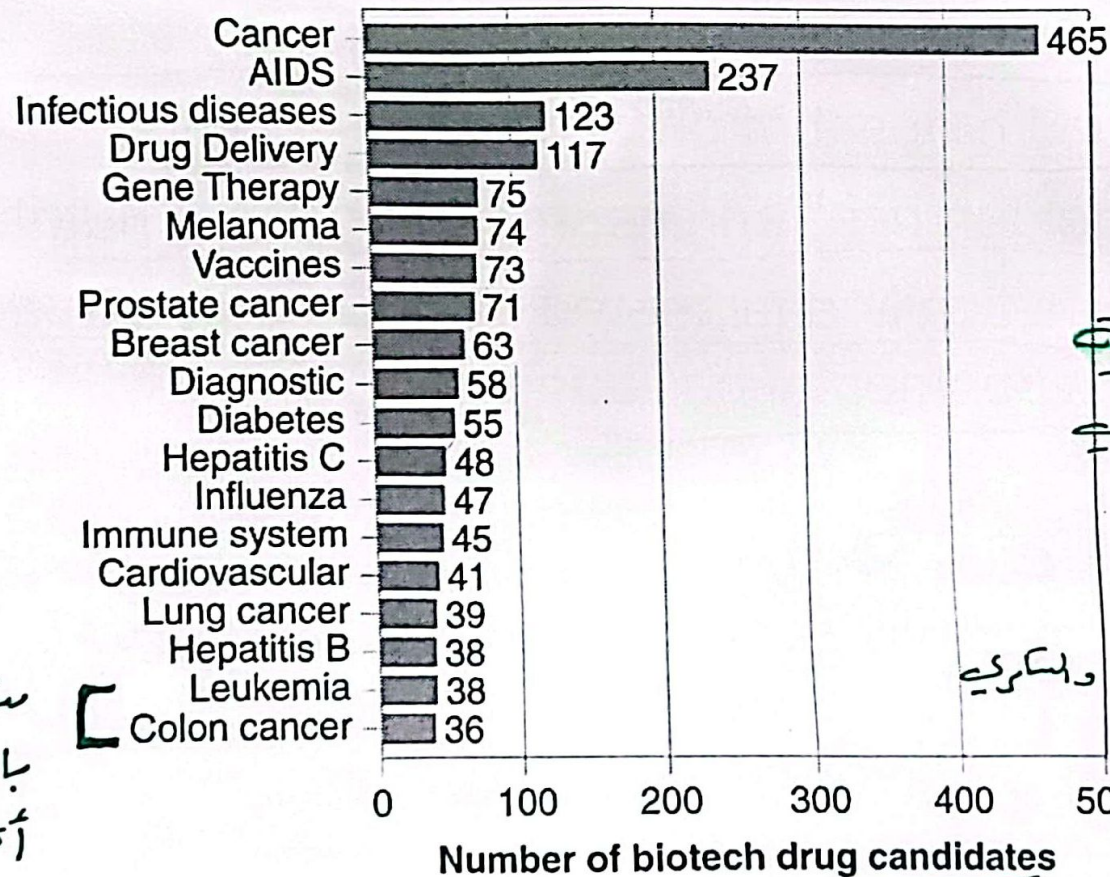
Biotechnology and What Does It Mean to You?

مكافحة

* Most drugs are developed to combat diseases affecting humans – Why?

مرسلة

* Which disease has the most drug candidates, Why?



الدواء عن طريق

البيوتكنولوجي

تختلف جداً ...

عشان هتعالج الأدوية

للمرضه بترى

الطريقه تستخدم

لعلاج حالات

Cancer، أمراض DM و السكري

تأثره محدده

وحده تألفه

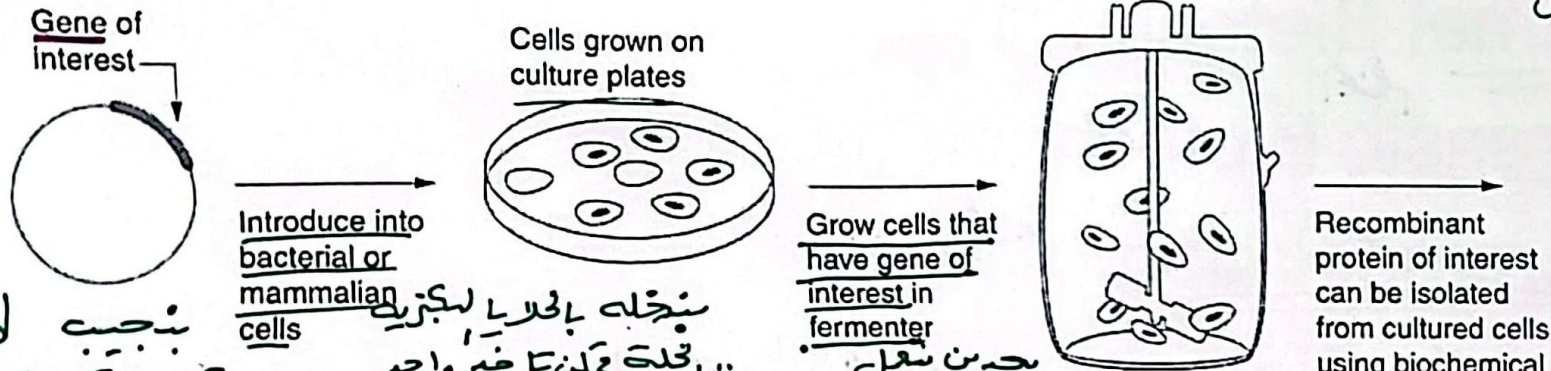
تصنيعاً أقل

نسبة الشفاء فيه عالية
بالتالي الأدوية المصنعة إليه
أقل من غيره ...

Biotechnology and What Does It Mean to You?

- Use genetically modified cultured cells to make protein of interest

a)



بعد انشائه من الانزيم
Sequence
تجربته بكميات
مغيرة
fermentation
عملية
sequencing

إذا طرأ على نتي
الانزيم و
product
التي تبث على
genetically modified
Bacteria
special enzyme
DNA و
purification
تضع بروتين
و يمكن ولا واحد
تضع بروتين
بجيب
Blasmid
تبع البكتريا
الحين التي بعد
b)



بروتين محدد تعبر من أسهل في Biotechnology

"البكتريا الجينية بغيرها من غير انشائه لتصبح بروتين يكون"

الحاكي ن البروتين التي بنا زخمه لا تحتوي على شكل

خا حرة 1 ✓

Biotechnology and What Does It Mean to You?

- Products of Modern Biotechnology
 - Example of recombinant proteins

TABLE 1.2 EXAMPLES OF PROTEINS MANUFACTURED FROM CLONED GENES

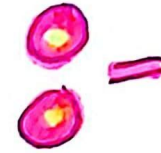
Product	Application
* Blood factor VIII (clotting factor)	<u>Treat hemophilia</u>
* Epidermal growth factor	<u>Stimulate antibody production in patients with immune system disorders</u>
* Growth hormone	Correct <u>pituitary deficiencies</u> and <u>short stature</u> in humans; other forms are used in cows to increase <u>milk production</u>
* Insulin	<u>Treat diabetes</u>
* Interferons	<u>Treat cancer and viral infections</u>
* Interleukins	<u>Treat cancer and stimulate antibody production</u>
* Monoclonal antibodies	<u>Diagnose and treat a variety of diseases including arthritis and cancer</u>
* Tissue plasminogen activator	<u>Treat heart attacks and stroke</u>

فقر الدم
↑ إنتاج الحليب

اللقاحات

سكتة دماغية

Types of Biotechnology



- Microbial Biotechnology
- Agricultural Biotechnology
- Animal Biotechnology
- Forensic Biotechnology الجرائم
- Bioremediation تنظيف بيئته
- Aquatic Biotechnology الأسماك، بلحوانات، صالون
- Medical Biotechnology والأدوية
- Regulatory Biotechnology

الطب الشرعي
العلاجية، كيميائية

Types of Biotechnology

التركيب

1

- **Microbial Biotechnology** – manipulation of microorganisms such as yeast and bacteria

- Create better enzymes معدّلها عشاق تجميل إزالة البقع
- More efficient decontamination processes for industrial waste product removal
- Used to clone and produce large amounts of important proteins used in human medicine

Examples of product from microbial conversion

Products	Typical micro-organism(s)	Approximate worldwide production [kg/year]
Bulk organic products		
Ethanol	<i>Saccharomyces cerevisiae</i>	$2 \cdot 10^{10}$ كمية كبيرة
Acetone / butanol	<i>Clostridium acetobutylicum</i>	$2 \cdot 10^6$ (butanol)
Biomass		
Starter cultures	Lactic acid bacteria, baker's yeast	$5 \cdot 10^8$
Single-cell protein	e.g., <i>Candida utilis</i>	$0.5-1 \cdot 10^8$
Organic acids		
Citrate	<i>Aspergillus niger</i>	$2-3 \cdot 10^8$
Lactate		
Amino acids		
L-glutamate	<i>Corynebacterium glutamicum</i>	$3 \cdot 10^8$
Antibiotics		
Penicilline	<i>Penicillium chrysogenum</i>	$3-4 \cdot 10^7$
cephalosporines	<i>Cephalosporium acremonium</i>	$1 \cdot 10^7$
tetracyclines	<i>Streptomyces aureofaciens</i>	$1 \cdot 10^7$

Note: The following overview is a non-exhaustive list of products. Source: Doran, 1995

استخدام كبير
للمنتج

Types of Biotechnology

2

• Agricultural Biotechnology

- 1 Plants more environmentally friendly that yield more per acre (genetically engineered)
- 2 Resistance to diseases and insects
- 3 Foods with higher protein or vitamin content
- 4 Drugs developed and grown as plant products
- 5 These better plants ultimately reduce production costs to help feed the growing world population

تقلل تكاليف الإنتاج للمساعدة في
تغذية سكان العالم المتزايدين ...



خردل

Mustard from
plant engineered
to contain more
heart-healthy oils

from unsaturated

fat

غني بزيت صحية أكثر ...

بطاطا مقلىة

French fries from
altered potatoes
with more starch
to absorb less oil
in cooking

نشا أكثر

حتى تمتصه زيت أقل

Beef from
extra-lean cows

لحم قليل الدهن أكثر

Cheese made with milk from
cows given recombinant bovine
growth hormone

يتطرح حليب أكثر

قمح
Wheat and sesame
seeds from
herbicide-resistant
crops

حتى تقبل الأعشاب الحرة
حواسين لبنته

خيار

Pickle from cucumber
that produces its own
insecticide

Ketchup from
high-solids,
slow-ripening
tomato

بطيخة
النضج

مشكلتها على الحدود الطويل وجبرهول ...

Types of Biotechnology

3 • Animal Biotechnology

1 Animals as a source of medically valuable proteins ذوقیه

- Antibodies

فعل بحیث تفاعل های AB بالکلیه

- Transgenic animals

2 Animals as important models in basic research

الغریب القایه

- Gene "knockout" experiments

- Design and testing of drugs and genetic therapies

والجاء بجره

الادویه، لکستیا،
على ل animal

3 Animal cloning

- Source of transplant organs