Ch 9 Reels – Captions

Class 12 Biology Ch 9: Biotechnology: Principles and Processes
Simple Learning Hub • 10 reels • Instagram + YouTube Shorts

REEL 01

Café ki chhoti si table par... janam hua genetic engineering ka! 🧬

📸 Instagram caption

Café ki chhoti si table par... janam hua genetic engineering ka! 🧬

✅ Duniya ka first recombinant DNA 1972 mein Stanley Cohen aur Herbert Boyer ne banaya: antibiotic resistance gene ko Salmonella typhimurium ke native plasmid se joda.
✅ DNA ko specific jagah kaata 'molecular scissors' yaani restriction enzymes ne, aur joda DNA ligase ne. Plasmid ne vector ka kaam kiya.
✅ Recombinant DNA ko E. coli mein daala gaya, jahan host ke DNA polymerase se iski multiple copies bani. Galti mat karna: plasmid Salmonella ka, cloning E. coli mein.

Poori video (Class 12 Biology Ch 9: Biotechnology: Principles and Processes) dekhni hai? Channel par jaiye: Simple Learning Hub 📺

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▶️ YouTube Shorts

TITLE: Café ki chhoti si table par... janam hua genetic engineering ka! 🧬 | First rDNA Class 12 #shorts
DESCRIPTION:
👉 Duniya ka first recombinant DNA 1972 mein Stanley Cohen aur Herbert Boyer ne banaya: antibiotic resistance gene ko Salmonella typhimurium ke native plasmid se joda.
👉 DNA ko specific jagah kaata 'molecular scissors' yaani restriction enzymes ne, aur joda DNA ligase ne. Plasmid ne vector ka kaam kiya.
👉 Recombinant DNA ko E. coli mein daala gaya, jahan host ke DNA polymerase se iski multiple copies bani. Galti mat karna: plasmid Salmonella ka, cloning E. coli mein.

📺 Poora chapter (Class 12 Biology Ch 9: Biotechnology: Principles and Processes, full

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REEL 02

DNA kaatne wali kainchi... asal mein bacteria ka hathiyaar hai! ✂️

📸 Instagram caption

DNA kaatne wali kainchi... asal mein bacteria ka hathiyaar hai! ✂️

✅ 1963 mein E. coli se two enzymes isolate hue jo bacteriophage ki growth restrict karte the: one DNA mein methyl groups jodta tha, the other DNA kaatta tha (restriction endonuclease).
✅ First restriction endonuclease jo specific nucleotide sequence par kaatta tha: Hind II. Ye 6 base pairs ki recognition sequence pehchaan kar hamesha particular point par kaatta hai.
✅ Aaj 900 se zyada restriction enzymes pata hain, jo 230 se zyada bacterial strains se isolate hue hain, aur har ek alag recognition sequence pehchaanta hai.

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TITLE: DNA kaatne wali kainchi... asal mein bacteria ka hathiyaar hai! ✂️ | Restriction Enzymes #shorts
DESCRIPTION:
👉 1963 mein E. coli se two enzymes isolate hue jo bacteriophage ki growth restrict karte the: one DNA mein methyl groups jodta tha, the other DNA kaatta tha (restriction endonuclease).
👉 First restriction endonuclease jo specific nucleotide sequence par kaatta tha: Hind II. Ye 6 base pairs ki recognition sequence pehchaan kar hamesha particular point par kaatta hai.
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REEL 03

Eco R one ka naam padhiye... poora address chhupa hai!

🔤

📸 Instagram caption

Eco R one ka naam padhiye... poora address chhupa hai! 🔤

✅ EcoRI: E = genus Escherichia, co = species coli, R = strain (RY 13).
✅ End ka Roman number (I) batata hai ki uss strain se ye enzyme kis order mein isolate hua.
✅ Restriction enzymes nucleases hain: exonucleases DNA ke ends se nucleotides hataate hain, endonucleases DNA ke andar specific positions par kaatte hain. Galti mat karna: R = strain, species nahi!

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TITLE: Eco R one ka naam padhiye... poora address chhupa hai! 🔤 | EcoRI Naming Trick #class12 #shorts
DESCRIPTION:
👉 EcoRI: E = genus Escherichia, co = species coli, R = strain (RY 13).
👉 End ka Roman number (I) batata hai ki uss strain se ye enzyme kis order mein isolate hua.
👉 Restriction enzymes nucleases hain: exonucleases DNA ke ends se nucleotides hataate hain, endonucleases DNA ke andar specific positions par kaatte hain. Galti mat karna: R = strain, species nahi!

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REEL 04

MALAYALAM ko ulta padhiye... same! Aur DNA bhi yahi trick karta hai! 🔁

📸 Instagram caption

MALAYALAM ko ulta padhiye... same! Aur DNA bhi yahi trick karta hai! 🔁

✅ DNA palindrome = base pairs ki aisi sequence jo two strands par same padhi jaati hai, jab reading orientation same ho. Example: 5' GAATTC 3' aur 3' CTTAAG 5'.
✅ Restriction enzymes palindrome ke centre se thoda hatkar, opposite strands par same two bases ke beech kaatte hain. Bachte hain single stranded overhangs: sticky ends.
✅ Sticky ends apne complementary cut counterparts se hydrogen bonds banaate hain, isliye DNA ligase ka kaam aasaan ho jaata hai.

Poori video (Class 12 Biology Ch 9: Biotechnology: Principles and Processes) dekhni hai? Channel par jaiye: Simple Learning Hub 📺

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▶️ YouTube Shorts

TITLE: MALAYALAM ko ulta padhiye... same! Aur DNA bhi yahi trick karta hai! 🔁 | Sticky Ends #shorts
DESCRIPTION:
👉 DNA palindrome = base pairs ki aisi sequence jo two strands par same padhi jaati hai, jab reading orientation same ho. Example: 5' GAATTC 3' aur 3' CTTAAG 5'.
👉 Restriction enzymes palindrome ke centre se thoda hatkar, opposite strands par same two bases ke beech kaatte hain. Bachte hain single stranded overhangs: sticky ends.
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REEL 05

DNA ki race mein... bada tukda jeetega ya chhota? ⚡

📸 Instagram caption

DNA ki race mein... bada tukda jeetega ya chhota? ⚡

✅ Gel electrophoresis: DNA fragments negatively charged hain, isliye electric field mein matrix ke through anode ki taraf move karte hain.
✅ Common matrix: agarose, seaweeds se nikla natural polymer. Sieving effect se fragments size ke hisaab se alag hote hain: jitna chhota fragment, utna door.
✅ DNA ko ethidium bromide se stain karke UV mein dekhte hain: bright orange bands. Band kaat kar gel se DNA nikaalna = elution.

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▶️ YouTube Shorts

TITLE: DNA ki race mein... bada tukda jeetega ya chhota? ⚡ | Gel Electrophoresis Class 12 #shorts
DESCRIPTION:
👉 Gel electrophoresis: DNA fragments negatively charged hain, isliye electric field mein matrix ke through anode ki taraf move karte hain.
👉 Common matrix: agarose, seaweeds se nikla natural polymer. Sieving effect se fragments size ke hisaab se alag hote hain: jitna chhota fragment, utna door.
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REEL 06

Iss chapter ka sabse important sawaal... recombinant ko pehchaanein kaise? 🔌

📸 Instagram caption

Iss chapter ka sabse important sawaal... recombinant ko pehchaanein kaise? 🔌

✅ pBR322 mein ampicillin aur tetracycline ke resistance genes hain. Foreign DNA ko tetracycline resistance gene ki BamHI site par ligate kiya.
✅ Recombinant plasmid tetracycline resistance kho deta hai, ampicillin resistance safe rehta hai. Recombinants ampicillin par ugenge, tetracycline par nahi; non-recombinants both par.
✅ Yaani one resistance gene transformants select karta hai, aur the other insertion se inactivate hokar recombinants pehchaanne mein madad karta hai.

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▶️ YouTube Shorts

TITLE: Iss chapter ka sabse important sawaal... recombinant ko pehchaanein kaise? 🔌 | pBR322 #shorts
DESCRIPTION:
👉 pBR322 mein ampicillin aur tetracycline ke resistance genes hain. Foreign DNA ko tetracycline resistance gene ki BamHI site par ligate kiya.
👉 Recombinant plasmid tetracycline resistance kho deta hai, ampicillin resistance safe rehta hai. Recombinants ampicillin par ugenge, tetracycline par nahi; non-recombinants both par.
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REEL 07

Blue colony ya colourless colony... recombinant kaun hai? 🔵

📸 Instagram caption

Blue colony ya colourless colony... recombinant kaun hai? 🔵

✅ Two antibiotic plates par plating cumbersome hai, isliye alternative selectable markers bane jo chromogenic substrate ke saath colour banaate hain.
✅ Recombinant DNA beta-galactosidase ki coding sequence ke andar insert hota hai, aur enzyme ka gene inactivate ho jaata hai: insertional inactivation.
✅ Insert nahi = blue colonies. Insert hai = colourless colonies = recombinants. Galti mat karna: blue colony non-recombinant hai!

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▶️ YouTube Shorts

TITLE: Blue colony ya colourless colony... recombinant kaun hai? 🔵 | Blue vs Colourless Class 12 #shorts
DESCRIPTION:
👉 Two antibiotic plates par plating cumbersome hai, isliye alternative selectable markers bane jo chromogenic substrate ke saath colour banaate hain.
👉 Recombinant DNA beta-galactosidase ki coding sequence ke andar insert hota hai, aur enzyme ka gene inactivate ho jaata hai: insertional inactivation.
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REEL 08

Ice, phir 42°C ka jhatka, phir ice... aur DNA andar! 🧊

📸 Instagram caption

Ice, phir 42°C ka jhatka, phir ice... aur DNA andar! 🧊

✅ DNA hydrophilic hai, cell membrane ke paar nahi ja sakta. Isliye bacteria ko divalent cation, jaise calcium, se 'competent' banaate hain.
✅ Cells ko recombinant DNA ke saath ice par, thodi der 42°C par (heat shock), phir wapas ice par: bacteria recombinant DNA le leta hai.
✅ Micro-injection: DNA seedha animal cell ke nucleus mein. Biolistics ya gene gun (plants): DNA coated gold ya tungsten ke high velocity micro-particles. Aur disarmed pathogen vectors.

Poori video (Class 12 Biology Ch 9: Biotechnology: Principles and Processes) dekhni hai? Channel par jaiye: Simple Learning Hub 📺

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▶️ YouTube Shorts

TITLE: Ice, phir 42°C ka jhatka, phir ice... aur DNA andar! 🧊 | Heat Shock & Gene Gun #shorts
DESCRIPTION:
👉 DNA hydrophilic hai, cell membrane ke paar nahi ja sakta. Isliye bacteria ko divalent cation, jaise calcium, se 'competent' banaate hain.
👉 Cells ko recombinant DNA ke saath ice par, thodi der 42°C par (heat shock), phir wapas ice par: bacteria recombinant DNA le leta hai.
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REEL 09

Single DNA tukde se lagbhag 1 billion copies... kaise? 🧪

📸 Instagram caption

Single DNA tukde se lagbhag 1 billion copies... kaise? 🧪

✅ PCR = Polymerase Chain Reaction: gene of interest ki multiple copies in vitro banti hain.
✅ Chahiye two sets of primers aur DNA polymerase. Har cycle: denaturation, primer annealing, extension. Baar baar repeat karein to DNA lagbhag billion times amplify hota hai.
✅ High temperature par bhi kaam kare, isliye thermostable DNA polymerase, jo bacterium Thermus aquaticus se isolate hua hai.

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▶️ YouTube Shorts

TITLE: Single DNA tukde se lagbhag 1 billion copies... kaise? 🧪 | PCR Class 12 #shorts
DESCRIPTION:
👉 PCR = Polymerase Chain Reaction: gene of interest ki multiple copies in vitro banti hain.
👉 Chahiye two sets of primers aur DNA polymerase. Har cycle: denaturation, primer annealing, extension. Baar baar repeat karein to DNA lagbhag billion times amplify hota hai.
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REEL 10

6 galtiyaan, jinki wajah se students iss chapter mein marks kho dete hain! ❌

📸 Instagram caption

6 galtiyaan, jinki wajah se students iss chapter mein marks kho dete hain! ❌

✅ Restriction enzymes sirf specific palindromic recognition sequence par kaatte hain. EcoRI mein R = strain (RY 13), species nahi.
✅ Gel mein chhota fragment sabse door jaata hai, aur DNA anode ki taraf chalta hai. Colourless colonies recombinant hain, blue nahi.
✅ BamHI (tetracycline gene) par insert = sirf ampicillin par ugega. First recombinant DNA: Salmonella typhimurium ka plasmid, cloning E. coli mein.

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TITLE: 6 galtiyaan, jinki wajah se students iss chapter mein marks kho dete hain! ❌ | Mistakes #shorts
DESCRIPTION:
👉 Restriction enzymes sirf specific palindromic recognition sequence par kaatte hain. EcoRI mein R = strain (RY 13), species nahi.
👉 Gel mein chhota fragment sabse door jaata hai, aur DNA anode ki taraf chalta hai. Colourless colonies recombinant hain, blue nahi.
👉 BamHI (tetracycline gene) par insert = sirf ampicillin par ugega. First recombinant DNA: Salmonella typhimurium ka plasmid, cloning E. coli mein.

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