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 📺

#class12 #class12biology #boardexam2027 #cbse #ncert #biology #neet #neet2027 #biotechnology #biotechnologyprinciplesandprocesses #simplelearninghub #recombinantdna #geneticengineering #cohenandboyer #plasmid #dnaligase

▶️ 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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video) channel par dekhiye: Simple Learning Hub
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HASHTAGS: #shorts #ytshorts #class12biology #biotechnology #ncert #boardexam2027 #neet #recombinantdna #geneticengineering #cohenandboyer #plasmid #dnaligase

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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.

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: 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).
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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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HASHTAGS: #shorts #ytshorts #class12biology #biotechnology #ncert #boardexam2027 #neet #ecori #restrictionenzymes #nucleases #endonuclease #namingtrick

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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.

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: 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!

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: 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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📺 Poora chapter (Class 12 Biology Ch 9: Biotechnology: Principles and Processes, full video) channel par dekhiye: Simple Learning Hub
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HASHTAGS: #shorts #ytshorts #class12biology #biotechnology #ncert #boardexam2027 #neet #bluewhitescreening #betagalactosidase #insertionalinactivation #recombinant #chromogenic

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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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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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📺 Poora chapter (Class 12 Biology Ch 9: Biotechnology: Principles and Processes, full video) channel par dekhiye: Simple Learning Hub
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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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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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▶️ YouTube Shorts

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.

📺 Poora chapter (Class 12 Biology Ch 9: Biotechnology: Principles and Processes, full video) channel par dekhiye: Simple Learning Hub
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HASHTAGS: #shorts #ytshorts #class12biology #biotechnology #ncert #boardexam2027 #neet #commonmistakes #mythvsfact #ecori #pbr322 #boardexamtips

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