

A 35-year romance with  
a seafaring microbe *p. 1006*

Social ties and policy reforms in  
China's S&T system *pp. 1019 & 1022*

Designing zeolites  
to react *pp. 1028 & 1051*

# Science

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## SYNTHETIC CHROMOSOMES

Remodeling the yeast genome  
piece by piece *p. 1038*



## LECTURE 4 BUILDING DNA

### LECTURE

DNA nomenclature  
single strand  
double strand  
bases  
base pairs  
linear  
circular  
blunt end  
sticky end

DNA products  
oligos  
fragments  
parts  
plasmids/integrations

Denovo synthesis  
solid phase chemistry  
<300bases

PCR  
DNA replication  
components (buffer, dNTPs, polymerase, template)  
protocol  
first 3 cycles  
thermostable polymerases  
DNA modification  
Overhangs  
primer design  
validation  
agarose gel electrophoresis  
sanger sequencing (GCTA, KBRG)

DNA assembly  
Restriction (EcoRI, GAATTC)  
components (buffer, RE, DNA)  
Ligation  
components (buffer, ligase, DNA)  
Restriction, ligation  
Time frame

Golden gate assembly  
Type II restriction enzyme (BsaI, GGTCTCN1)  
Restriction ligation  
Cyclical protocol

### EXERCISE

Design primers to amplify GFP orf  
Execute virtual PCR  
Design primers to amplify GFP orf with BsaI OH  
Design primers to amplify vector with OH  
Assemble a gene with 3XGFP