LECTURE #3 [pK_a VALUE]

ON SCREEN: SHOW FACTORY. NOTE MANY, MANY MATERIALS.

GIRDER: STEEL → MICROTUBULES
↳ COLLAGEN

MACHINE: PLASTIC, METAL, RUBBER } ENZYME!

WINDOW: GLASS CRYSTALLIN LENS FIBER

WHY MIGHT ORGANISMS USE THIS STRATEGY?

KEY
SCREEN
ME
STUDENTS
BOARD

ON SCREEN: BRIO TRAIN!

THEMES:
- STRUCTURE → PROPERTIES
- DIVERSITY VIA COMBOS

→ POLYMERS
→ AMINO ACID BACKBONE
→ SIDECHAINS
→ PROPERTIES
→ ELECTROSTATICS

- GOES ON FOREVER
- DIRECTIONALITY TO CHAIN.

POLYMERS:

LENGTH (l):	1	2	3	4
POSSIBILITIES (k):	20	20	20	20
TOTAL POSSIBLE:	20	20×20	20×20×20	20×20×20×20
	20^1	20^2	20^3	20^4
$k^l = 20^{100}$	20	401	8,001	160,001

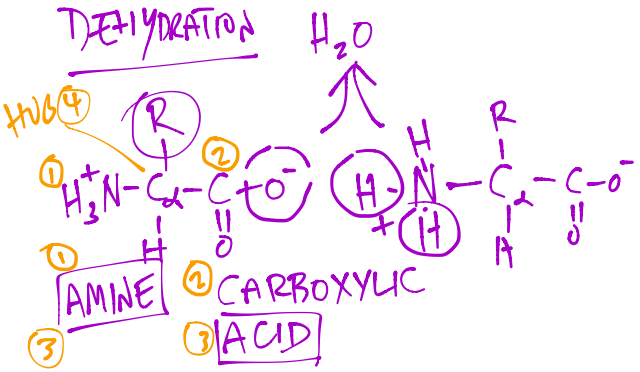
$\sim 1 \times 10^{160}$

1×10^{80} ← ATOMS IN VISIBLE UNIVERSE!

ASTRONOMICAL NUMBERS? PSHAW! CHEMICAL NUMBERS.

TITIN: 34,350 AA LONG.

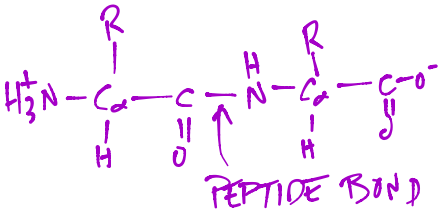
PEPTIDE BONDS

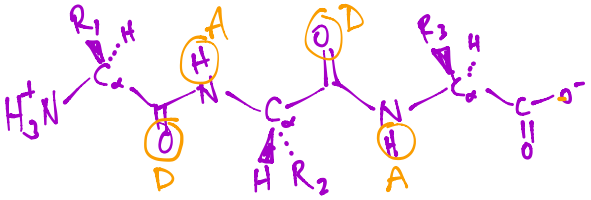


IMPORTANT CHARACTERISTICS:

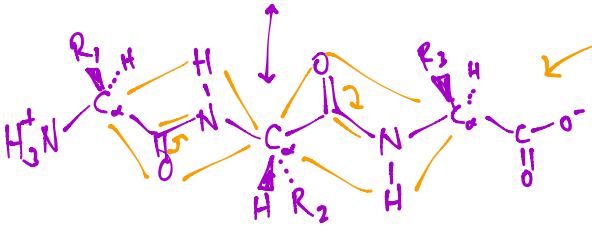
1. DIRECTIONAL TERMINI
2. UNBOUNDED
3. REPEATING POLARITY
4. PLANARITY

BUILD WITH DRAW





- REVEAL DONOR & ACCEPTOR.
- NOTE SECONDARY STRUCTURE.



RESTRICTS DEGREES OF FREEDOM. PROMOTES STRUCTURE.

SHOW PEPTIDE ON SCREEN IN PYMOL

SIDECHAINS

SHOW PEPTIDE ORG ON SCREEN

HOW ELSE MIGHT YOU ORGANIZE?

WHAT DO YOU THINK DIVERSE S.C. ALLOW?