Handout 6
Cell-ebrity study guide

Preparation
Cut out the attached clues into separate strips and place into a bowl. Shuffle around. You will also need a stopwatch, a watch with a second hand, or a cell phone with a minute countdown timer.

How to play
Assemble two teams of at least two people per team. Team A goes first and selects one person to be the reader while team B monitors the time. The reader has 1 minute to get his team to guess as many clues as possible, randomly drawn from the bowl. Then, team B selects a reader and has 1 minute to guess as many clues as possible while team A monitors the time. The process repeats, with readers rotating in each team, until there are no clues left. Then, the team with the most number of guessed clues wins.

The following rules must be strictly upheld by the reader, and breaking one will cause the reader to forfeit that round for his team:

- Correctly guessed clues are removed from the bowl.

- The reader cannot say anything on the clue, or any grammatical permutation thereof.

- Clues that directly convey the spelling of a word, like "Starts with letter C" or "Rhymes with co-team," are illegal. However, indirect clues like "Starts with the same letter as my first name" are legal.

- The reader can never pass on a clue, but must remain on the current one until his/her team guesses it or until the time is up.

- The reader can never select a clue, but must always choose one randomly and cannot re-choose.

- The reader cannot reveal what the correct answer to an unguessed clue was if time is called, and the unguessed clue must be returned to the bowl.

Alternative for study alone
Use the clues like flash cards. Draw a clue. See if you can explain what it is to yourself without looking up the answer. When thinking about your explanation, you might address: (a) What kind of molecule is it (protein, DNA, etc)? (b) What is its function? (c) What cellular processes is it involved with? (d) Why is it important to the cell?

prokaryote	nucleotide
eukaryote	amino acid
genome	polysaccharide
DNA	fatty acid
RNA	ribose
protein	lipids
bacteria	deoxyribose
archea	glucose
organelle	condensation reaction
covalent bond	hydrolysis reaction
van der Waals attractions	cellulose
kcal/mol	glycolipid
electrostatics	glycoprotein
hydrogen bond	phospholipid
hydrophobic interaction	amphipathic
specificity	membrane
affinity	pyrimidines
recognition	purines

phosphate	endocytosis
adenosine triphosphate / ATP	mitochondria
guanosine triphosphate / GTP	chloroplasts
peptide bond	entropy
ribosomes	enthalpy
vesicle	Gibbs free energy
plasma membrane	state function
cell wall	second law
cytoplasm	transition state
cytosol	activated process
extracellular matrix	enzyme
cytoskeleton	free energy transduction
nuclear envelope	anabolism
endoplasmic reticulum	catabolism
Golgi apparatus	NADH / NADPH
lysosomes	transport protein
peroxisomes	motor protein
endosomes	fibrillar protein

storage protein	x-ray diffraction
receptor protein	NMR spectroscopy
side chain	Protein DataBank
disulfide bond	sequence identity
folding	binding
native state / structure	ligand
denaturation	affinity
folding pathway	specificity
two-state folder	dissociation constant
aggregation	antibody
misfolding	immunoglobulins
chaperones	antigen
secondary structure	allostery
tertiary structure	cooperativity
alpha helix	cofactor
beta sheet	Michaelis-Menten kinetics
loops and turns	quasi-steady state approximation
parallel / antiparallel	Linweaver-Burk

competitive inhibition	chromatin
product inhibition	DNA polymerase
non-competitive inhibition	leading strand
substrate inhibition	lagging strand
mixed inhibition	proofreading
kinase	homologous recombination
phosphatase	messenger RNA (mRNA)
phosphorylation	uracil
base pairing	ribosomal RNA (rRNA)
gene	transfer RNA (tRNA)
expression	RNA polymerase
coding / non-coding	transcription promoter
chromosome	transcription terminator
replication origin	transcription factor
centromere	intron
telomere	splicing
nucleosomes	codon
histone	reading frame

ribozyme	permeability
proteases	lysis
proteasome	osmotic pressure
ubiquitin	ion pumping
cholesterol	transporter
liposome	channels
vesicle	passive transport
critical micelle concentration	active transport
self-assembly	electrostatic potential
lipid raft	membrane potential
transmembrane protein	sodium-potassium pump
helix bundle	coupled transporter
beta barrel	symport
ion channel	antiport
cell cortex	uniport
spectrin	calcium pump
Stokes-Einstein formula	Nernst equation
partition coefficient	action potential

neurotransmitters	repressor
voltage-gated channel	activator
random walk	DNA methylation
Brownian motion	differentiation
vesicular transport	riboswitch
free ribosome	microRNA
membrane-bound ribosome	signal transduction
signal sequence	signal relay
nuclear pore	signal distribution
start/stop transfer sequence	signal amplification
glycosylation	signal integration
exocytosis	vesicle fusion
endocytosis	endocrine signaling
pinocytosis	paracrine signaling
phagocytosis	neuronal signaling
signal cascade	contact-dependent signaling
promoter	steroid hormones
transcription regulator	thyroid hormones

ion-channel-coupled receptor	fibronectin
enzyme-coupled receptor	integrins
G-protein-coupled receptor	proteoglycans
G-protein	cell junction
keratins	stem cell
nuclear lamina	cancer
kinesins	
dyneins	
centrosome	
self-assembly	
myosin	
epithelial tissue	
connective tissue	
muscle tissue	
nervous tissue	
collagen	
fibroblast	
osteoblast	