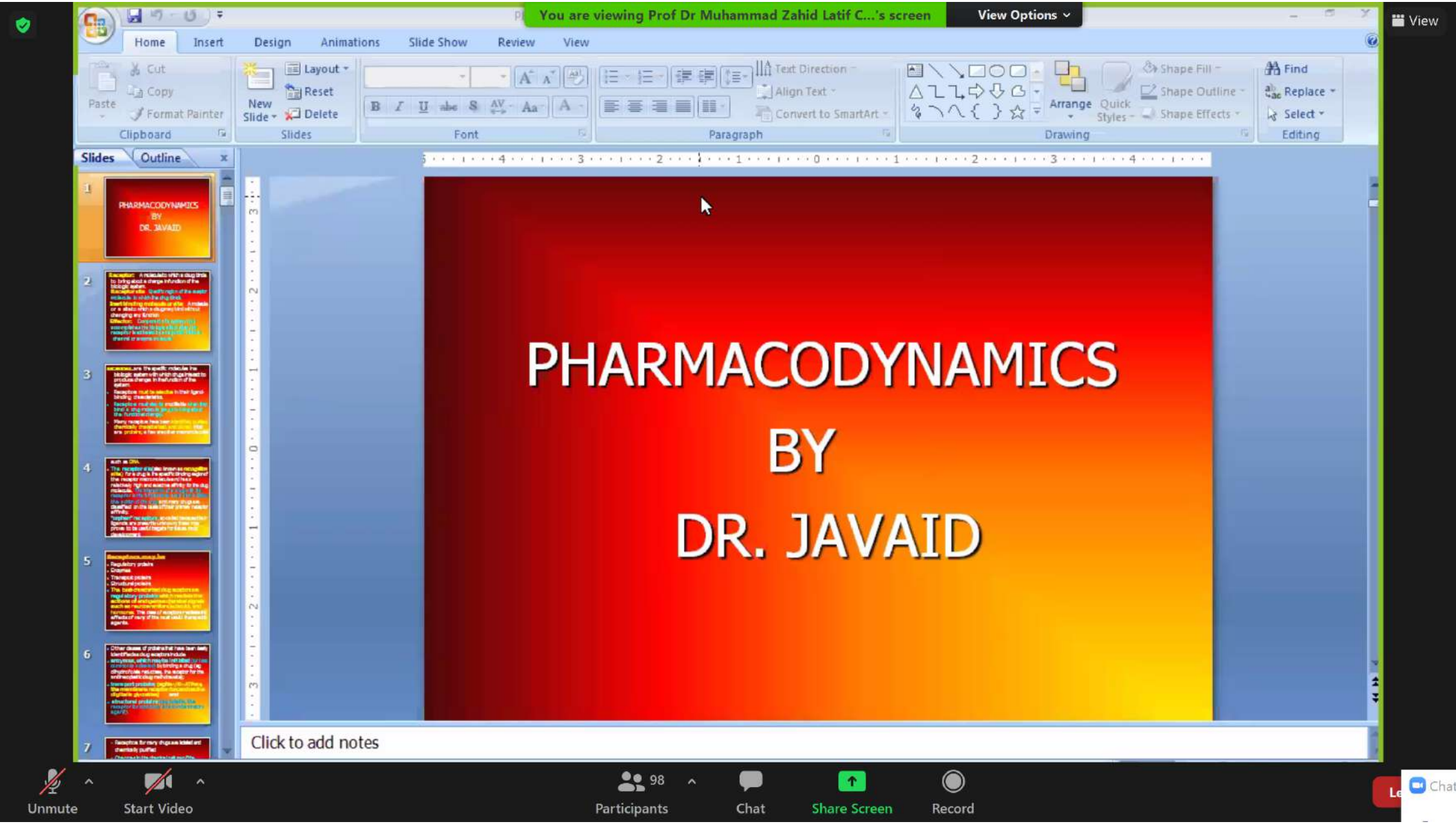
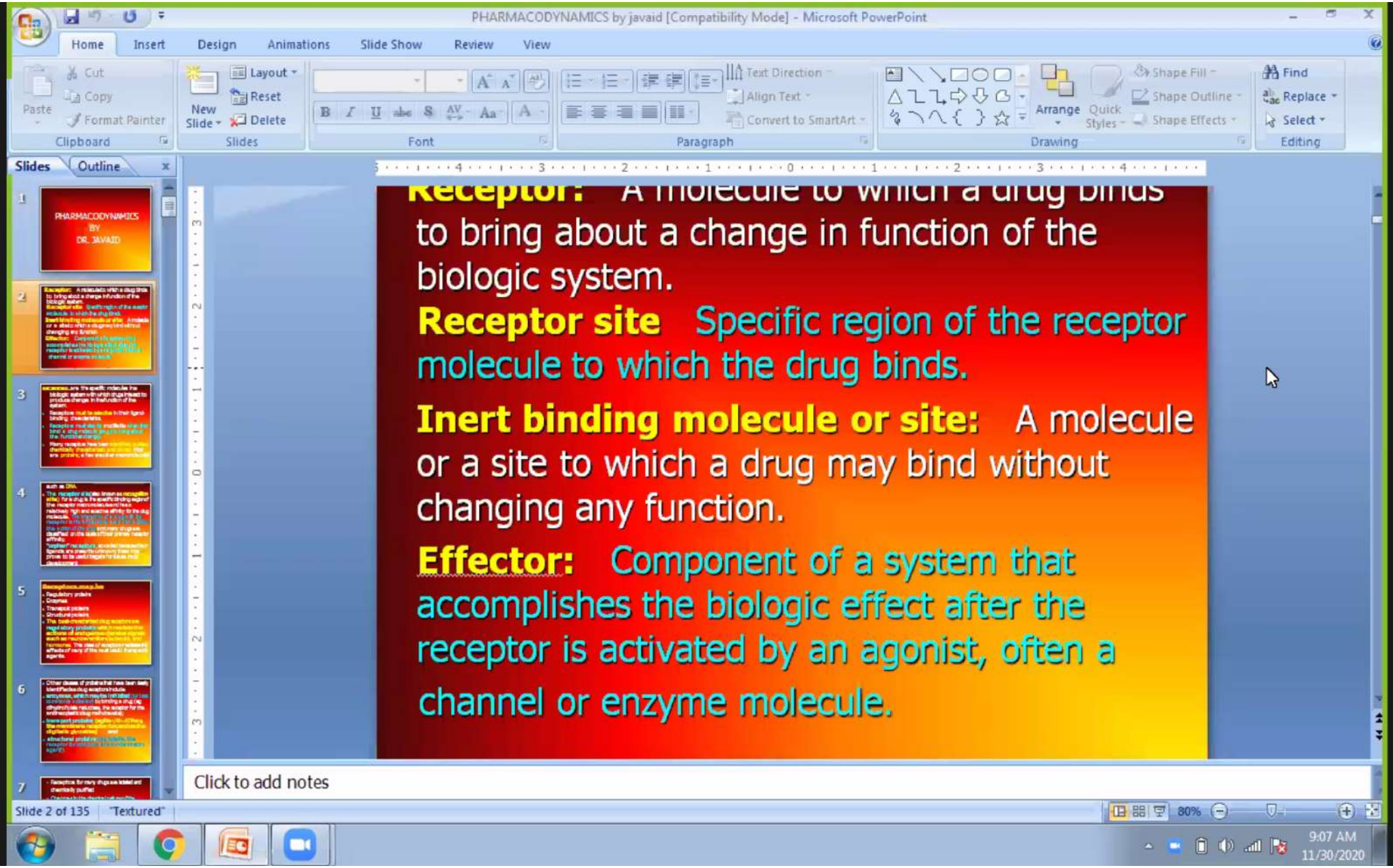
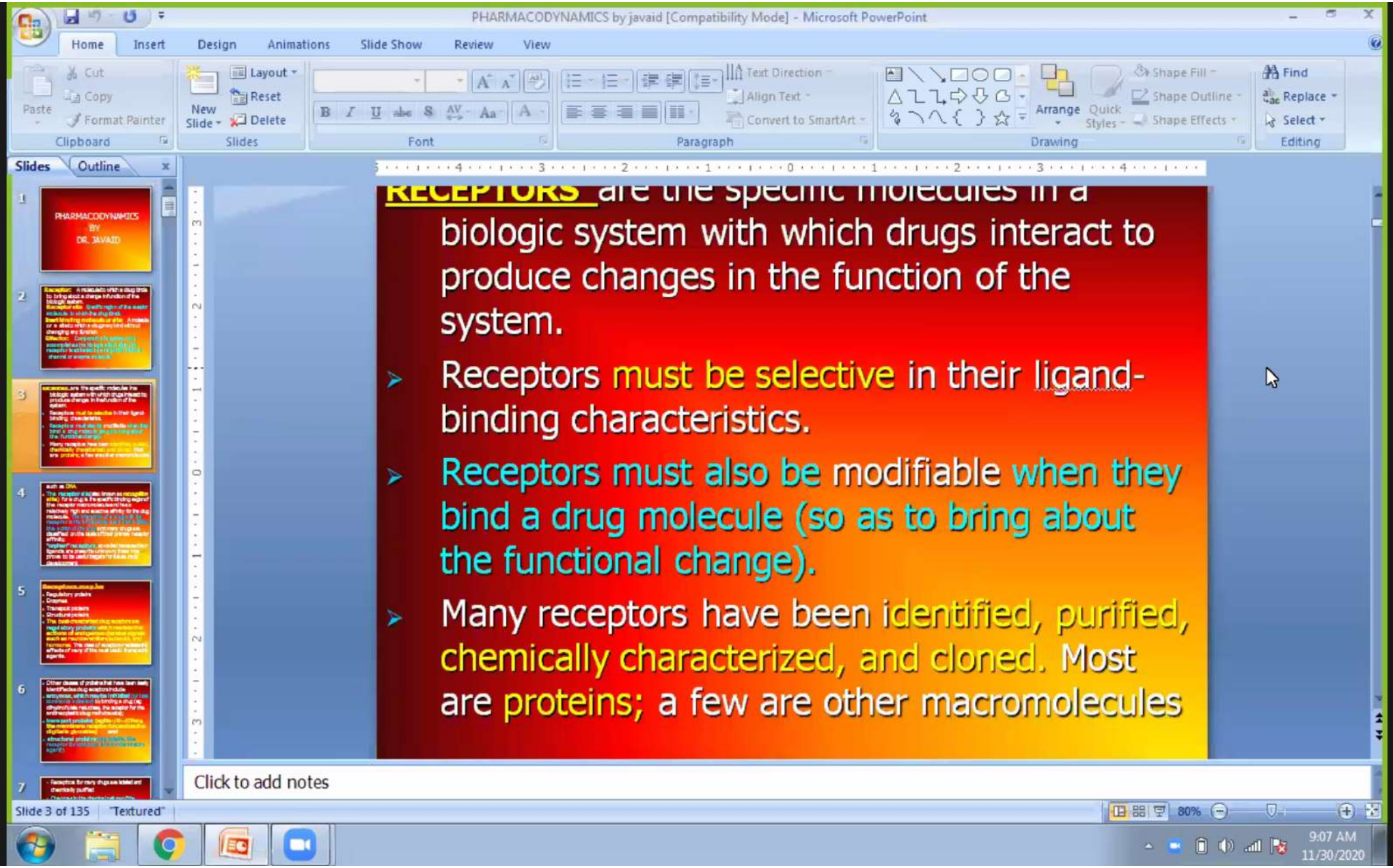
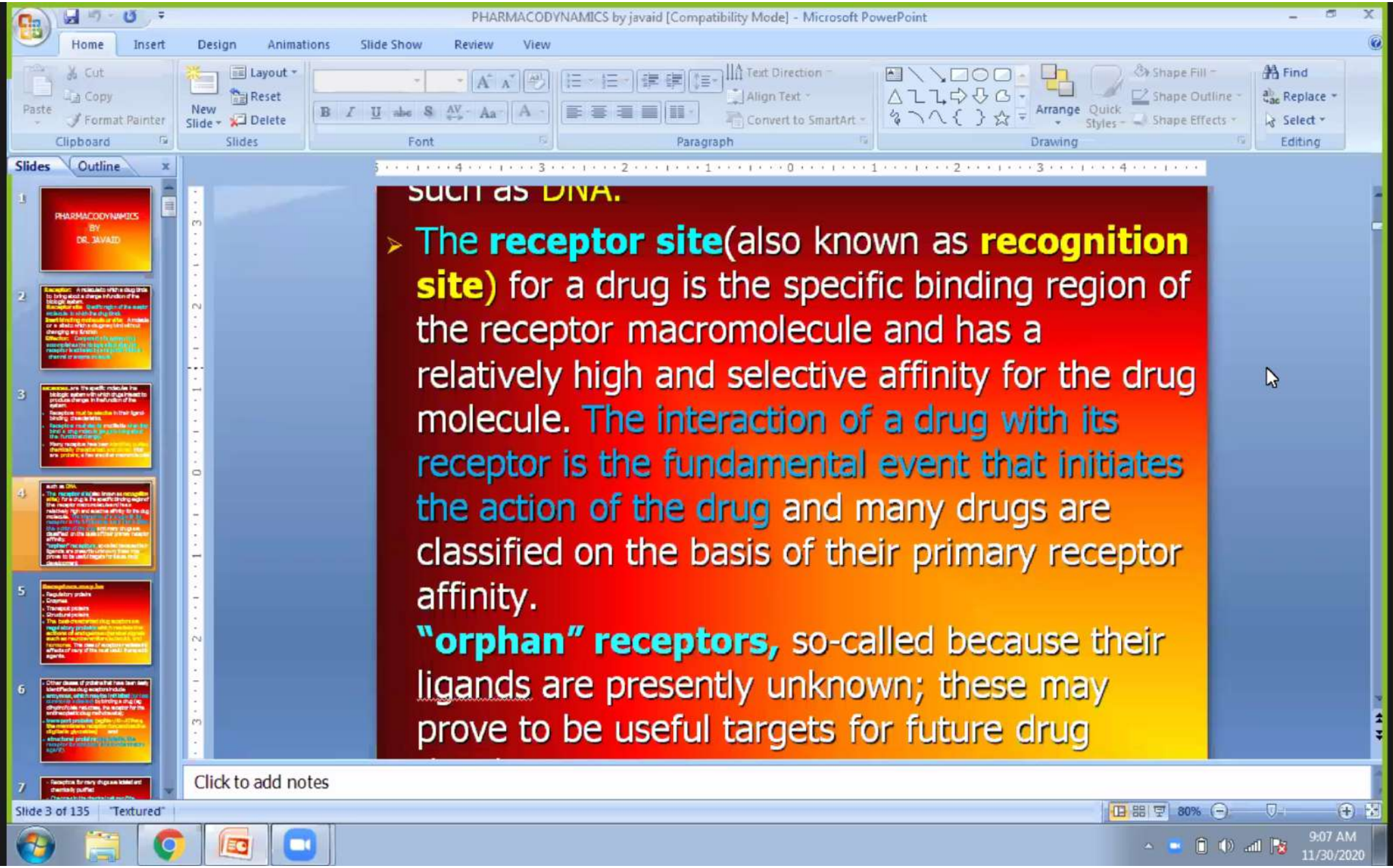
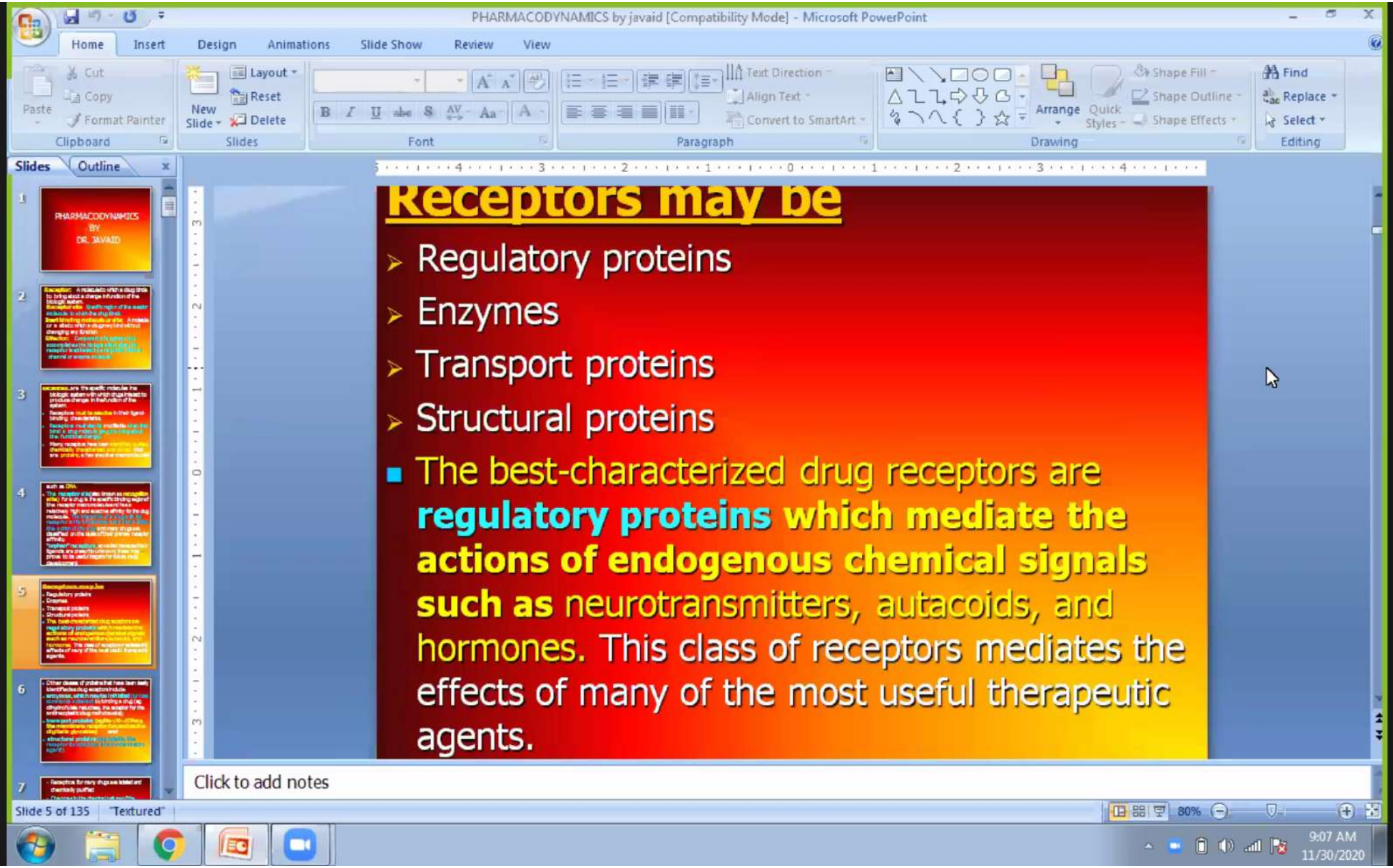
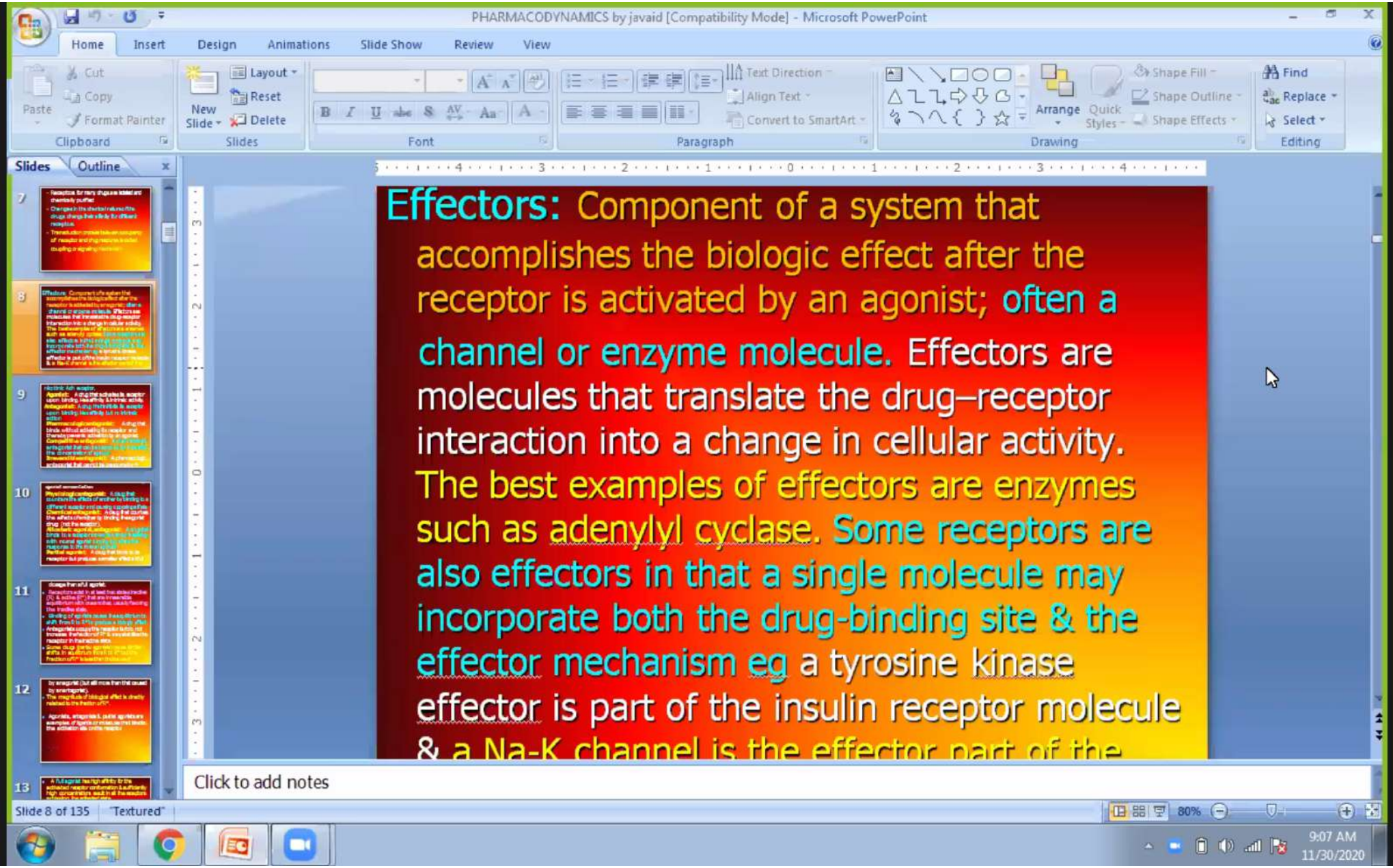

You are viewing Prof Dr Muhammad Zahid Latif C...'s screen
View Options
View
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
PHARMACODYNAMICS
BY
DR. JAVAID
Click to add notes
Unmute
Start Video
98
Participants
Chat
Share Screen
Record

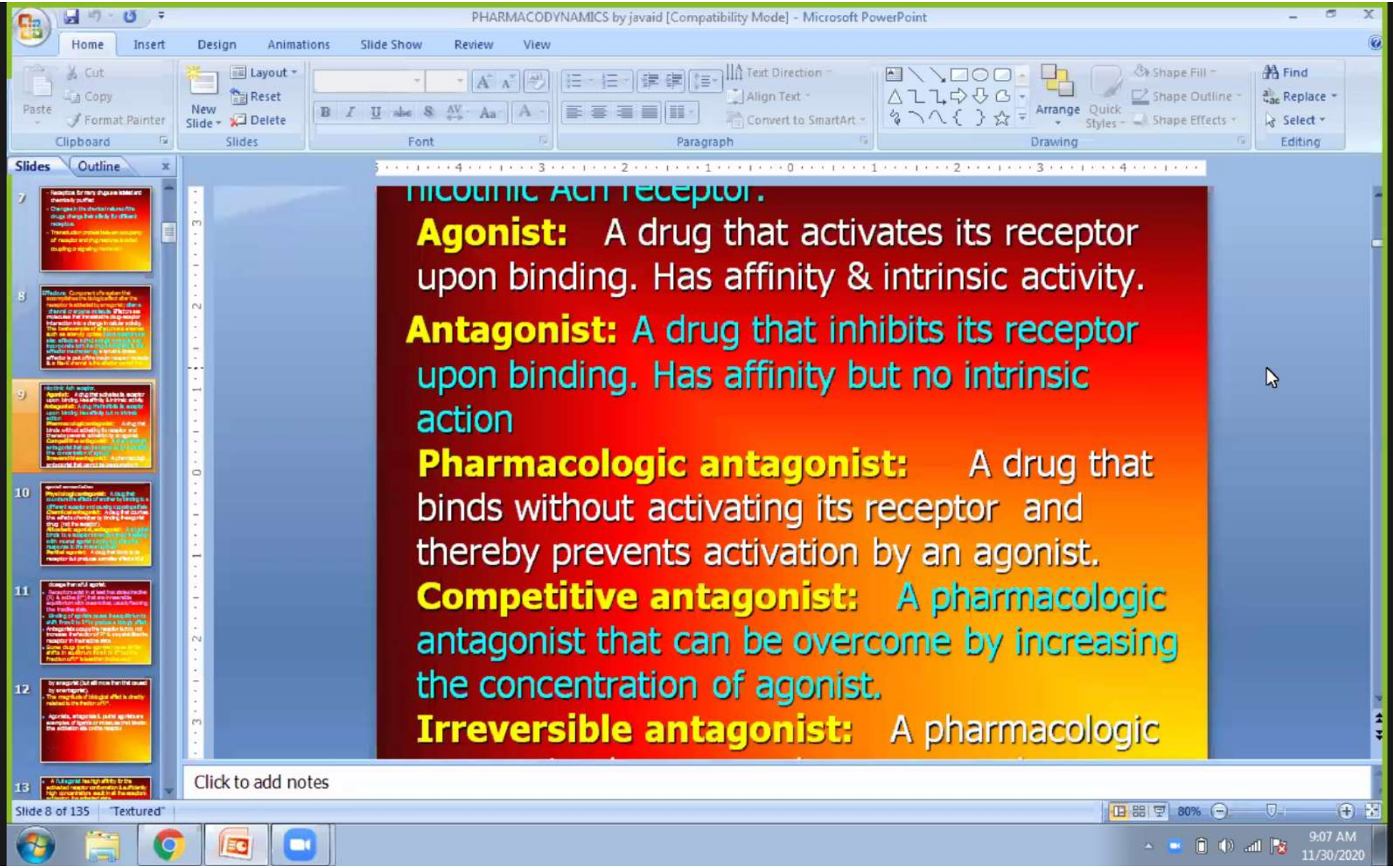

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
to bring about a change in function of the biologic system.
Receptor site Specific region of the receptor molecule to which the drug binds.
Inert binding molecule or site: A molecule or a site to which a drug may bind without changing any function.
Effector: Component of a system that accomplishes the biologic effect after the receptor is activated by an agonist, often a channel or enzyme molecule.
Click to add notes
Slide 2 of 135
"Textured"
80%
9:07 AM
11/30/2020

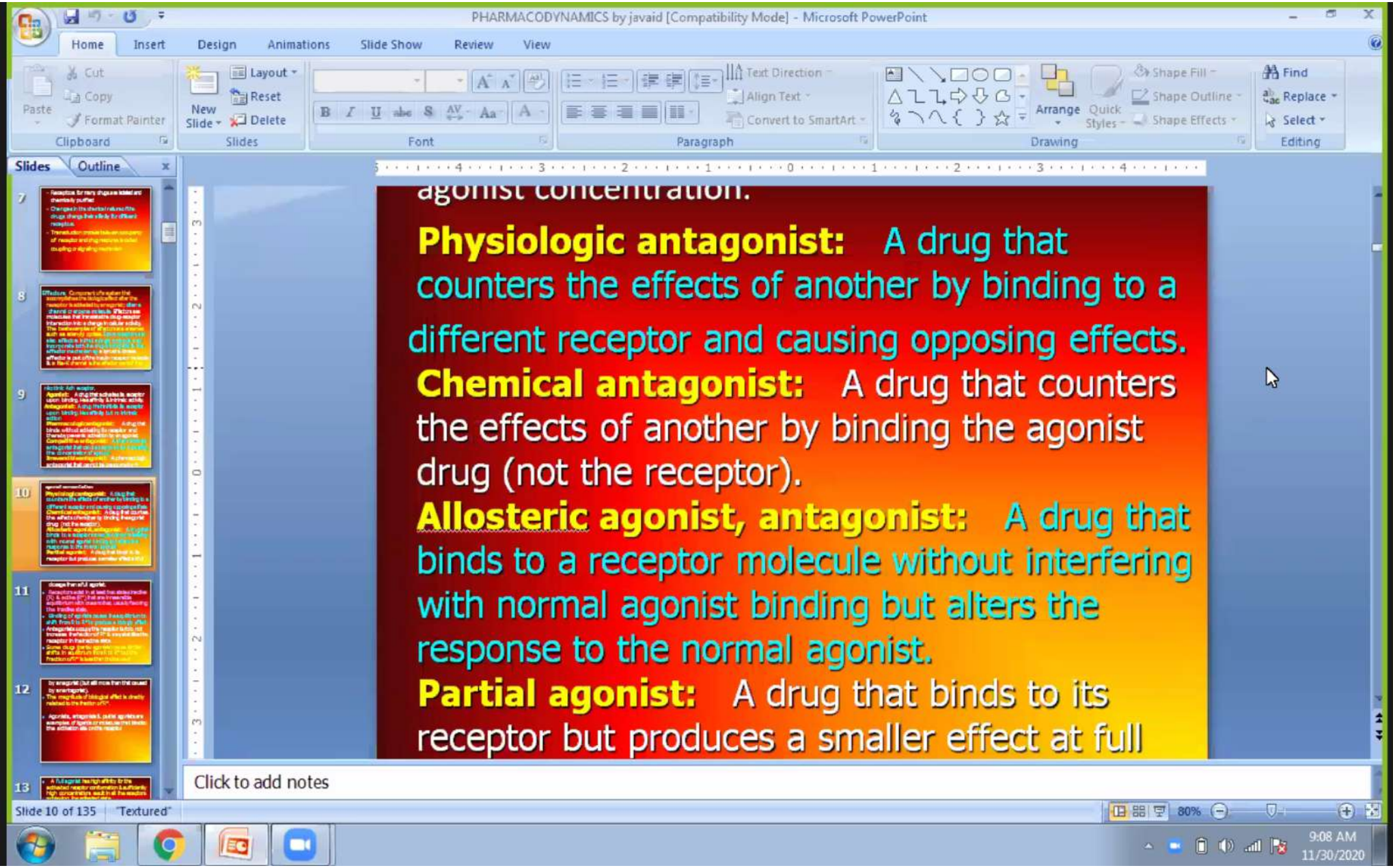

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
RECEPTORS are the specific molecules in a biologic system with which drugs interact to produce changes in the function of the system.
Receptors must be selective in their ligand-binding characteristics.
Receptors must also be modifiable when they bind a drug molecule (so as to bring about the functional change).
Many receptors have been identified, purified, chemically characterized, and cloned. Most are proteins; a few are other macromolecules
Click to add notes
Slide 3 of 135
"Textured"
80%
9:07 AM
11/30/2020

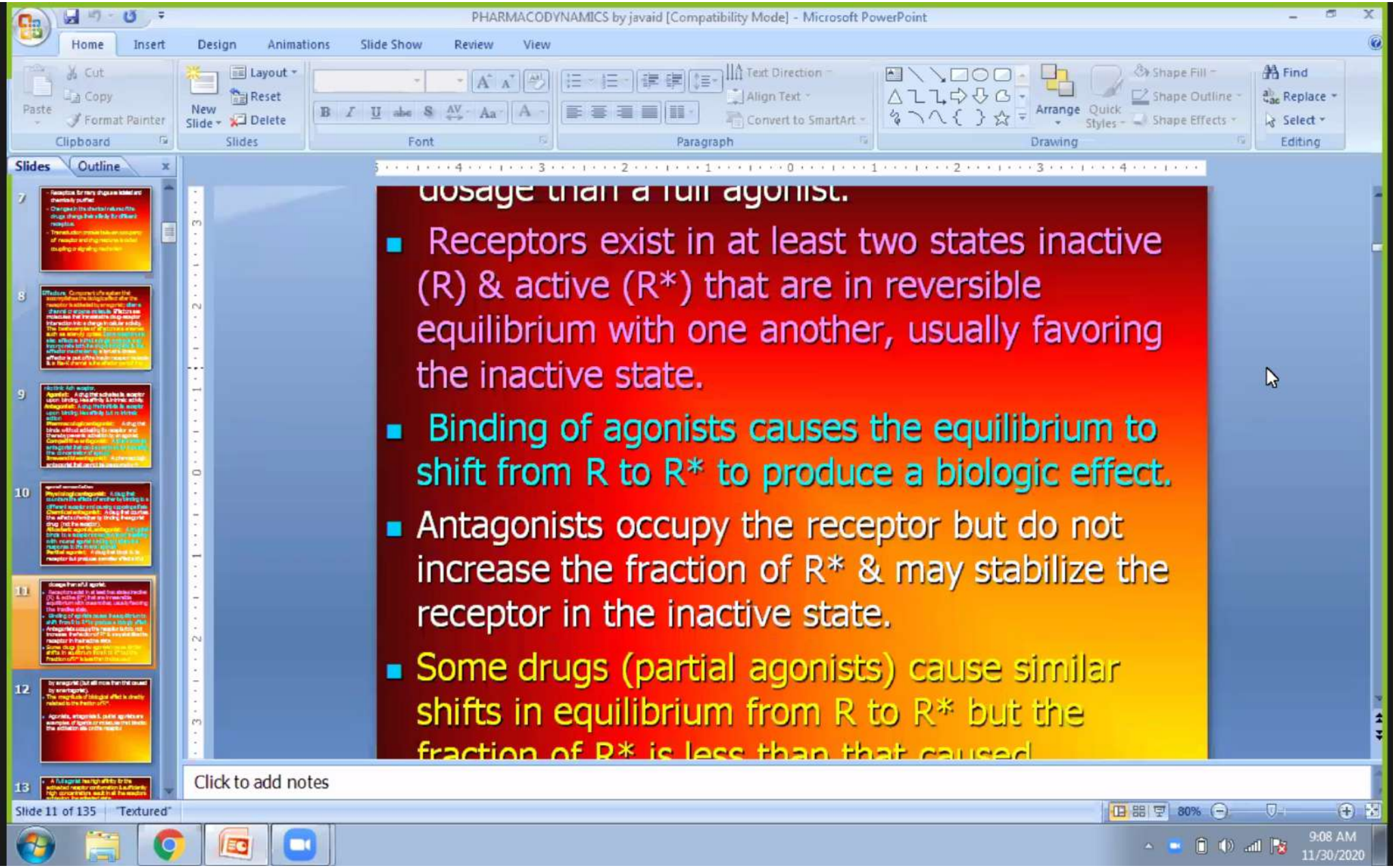

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
such as DNA.
The receptor site(also known as recognition site) for a drug is the specific binding region of the receptor macromolecule and has a relatively high and selective affinity for the drug molecule. The interaction of a drug with its receptor is the fundamental event that initiates the action of the drug and many drugs are classified on the basis of their primary receptor affinity.
"orphan" receptors, so-called because their ligands are presently unknown; these may prove to be useful targets for future drug
Click to add notes
Slide 3 of 135
"Textured"
80%
9:07 AM
11/30/2020

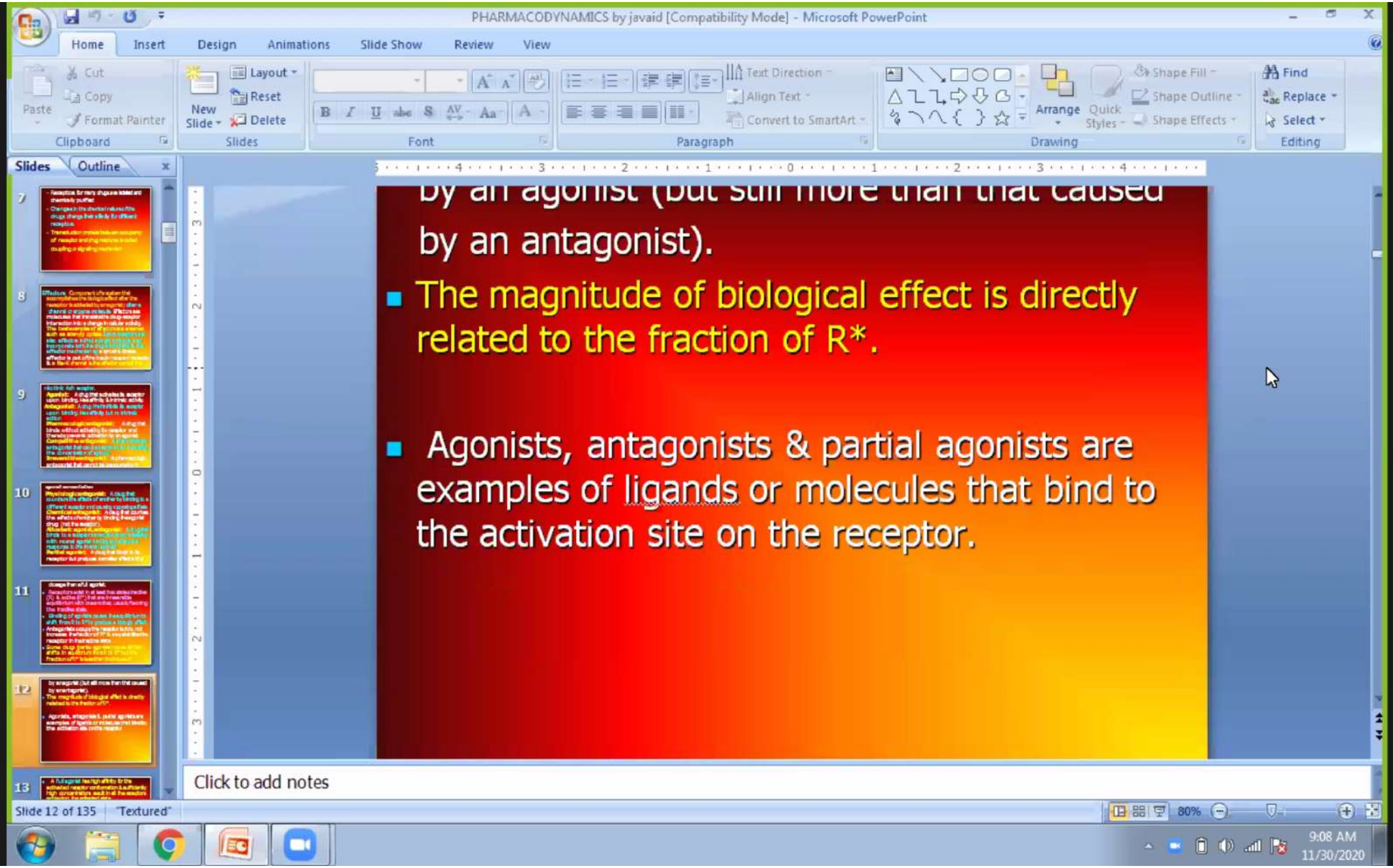

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
Receptors may be
Regulatory proteins
Enzymes
Transport proteins
Structural proteins
The best-characterized drug receptors are regulatory proteins which mediate the actions of endogenous chemical signals such as neurotransmitters, autacoids, and hormones. This class of receptors mediates the effects of many of the most useful therapeutic agents.
Click to add notes
Slide 5 of 135
"Textured"
80%
9:07 AM
11/30/2020

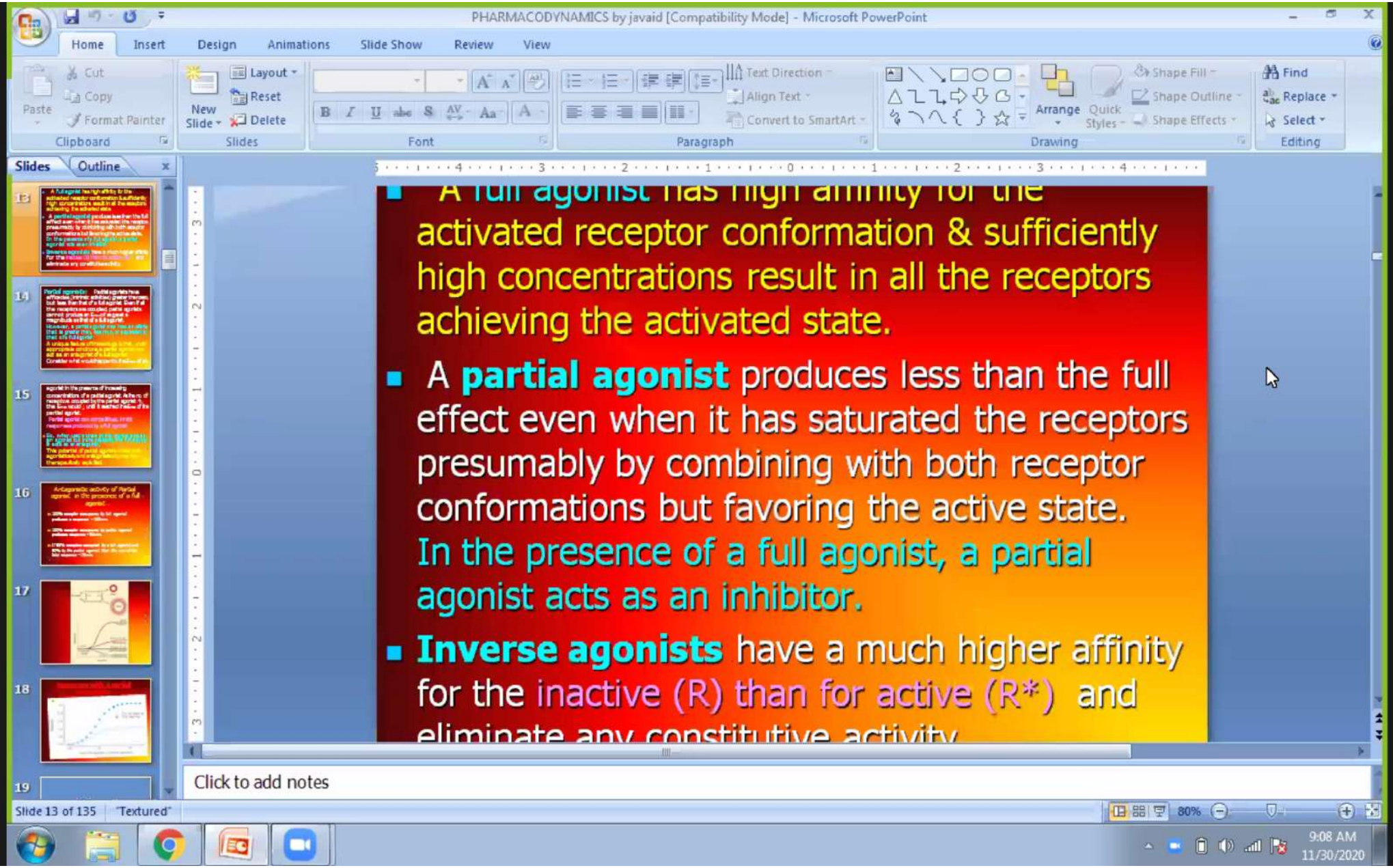

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
Effectors: Component of a system that accomplishes the biologic effect after the receptor is activated by an agonist; often a channel or enzyme molecule. Effectors are molecules that translate the drug–receptor interaction into a change in cellular activity. The best examples of effectors are enzymes such as adenylyl cyclase. Some receptors are also effectors in that a single molecule may incorporate both the drug-binding site & the effector mechanism eg a tyrosine kinase effector is part of the insulin receptor molecule & a Na-K channel is the effector part of the
Click to add notes
Slide 8 of 135
"Textured"
80%
9:07 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
nicotinic Ach receptor:
Agonist: A drug that activates its receptor upon binding. Has affinity & intrinsic activity.
Antagonist: A drug that inhibits its receptor upon binding. Has affinity but no intrinsic action
Pharmacologic antagonist: A drug that binds without activating its receptor and thereby prevents activation by an agonist.
Competitive antagonist: A pharmacologic antagonist that can be overcome by increasing the concentration of agonist.
Irreversible antagonist: A pharmacologic
Click to add notes
Slide 8 of 135
"Textured"
80%
9:07 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
agonist concentration.
Physiologic antagonist: A drug that counters the effects of another by binding to a different receptor and causing opposing effects.
Chemical antagonist: A drug that counters the effects of another by binding the agonist drug (not the receptor).
Allosteric agonist, antagonist: A drug that binds to a receptor molecule without interfering with normal agonist binding but alters the response to the normal agonist.
Partial agonist: A drug that binds to its receptor but produces a smaller effect at full
Click to add notes
Slide 10 of 135
"Textured"
80%
9:08 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
dosage than a full agonist.
Receptors exist in at least two states inactive (R) & active (R*) that are in reversible equilibrium with one another, usually favoring the inactive state.
Binding of agonists causes the equilibrium to shift from R to R* to produce a biologic effect.
Antagonists occupy the receptor but do not increase the fraction of R* & may stabilize the receptor in the inactive state.
Some drugs (partial agonists) cause similar shifts in equilibrium from R to R* but the
fraction of R* is less than that caused
Click to add notes
Slide 11 of 135
"Textured"
80%
9:08 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
by an agonist (but still more than that caused by an antagonist).
The magnitude of biological effect is directly related to the fraction of R*.
Agonists, antagonists & partial agonists are examples of ligands or molecules that bind to the activation site on the receptor.
Click to add notes
Slide 12 of 135
"Textured"
80%
9:08 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
A full agonist has high affinity for the activated receptor conformation & sufficiently high concentrations result in all the receptors achieving the activated state.
A partial agonist produces less than the full effect even when it has saturated the receptors presumably by combining with both receptor conformations but favoring the active state.
In the presence of a full agonist, a partial agonist acts as an inhibitor.
Inverse agonists have a much higher affinity for the inactive (R) than for active (R*) and
Click to add notes
Slide 13 of 135
"Textured"
80%
9:08 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste — Clipboard

New Slide Layout Reset Delete — Slides

Font — Paragraph — Text Direction Align Text Convert to SmartArt

Arrange Quick Styles Shape Fill Shape Outline Shape Effects — Drawing

Find Replace Select — Editing

Slides Outline

13 14 15 16 17 18 19

Partial agonists: Partial agonists have efficacies (intrinsic activities) greater than zero, but less than that of a full agonist. Even if all the receptors are occupied, partial agonists cannot produce an E_{max} of as great a magnitude as that of a full agonist.

However, a partial agonist may have an affinity that is greater than, less than, or equivalent to that of a full agonist.

A unique feature of these drugs is that, under appropriate conditions, a partial agonist may act as an antagonist of a full agonist.

Consider what would happen to the E_{max} of an

Click to add notes

Slide 13 of 135 "Textured" 80%

9:08 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

agonist in the presence of increasing concentrations of a partial agonist. As the no. of receptors occupied by the partial agonist ↑, the E_{max} would ↓ until it reached the E_{max} of the partial agonist.

Partial agonist can competitively inhibit responses produced by a full agonist.

- So, when used alone a partial agonist acts as an agonist but in the presence of a full agonist it acts as an antagonist.

This potential of partial agonists to act both agonistically and antagonistically may be therapeutically exploited

Click to add notes

Slide 15 of 135 "Textured"

9:08 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font Paragraph Drawing Editing

Text Direction Align Text Convert to SmartArt

Arrange Quick Styles Shape Fill Shape Outline Shape Effects

Find Replace Select

Slides Outline

13 14 15 16 17 18 19

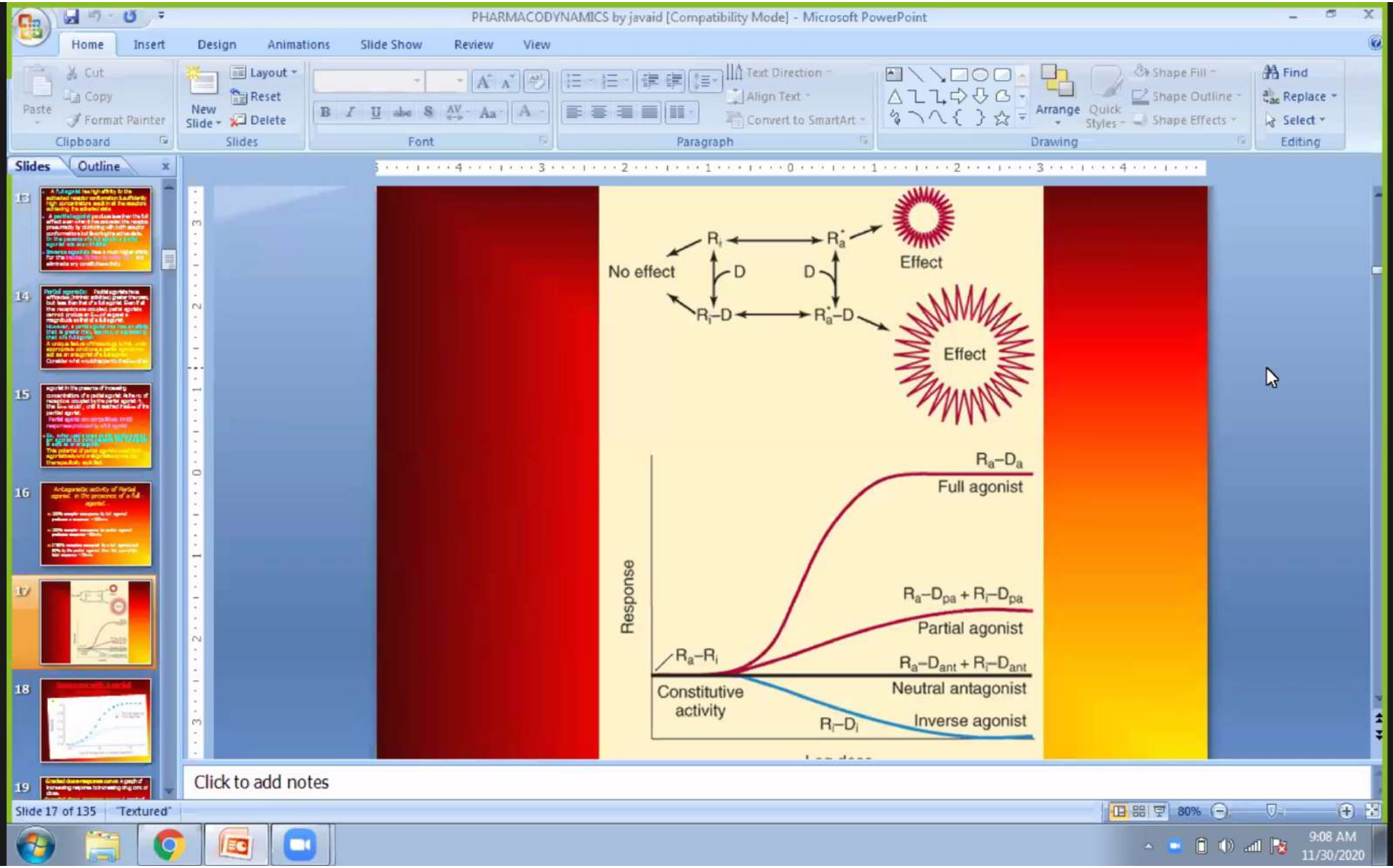
Antagonistic activity of Partial agonist in the presence of a full agonist

- 100% receptor occupancy by full agonist produces a response =100mm.
- 100% receptor occupancy by partial agonist produces response =50mm.
- If 50% receptors occupied by a full agonist and 50% by the partial agonist then the sum of the total response =75mm.

Click to add notes

Slide 16 of 135 "Textured" 80%

9:08 AM 11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
No effect
D
D
Effect
Effect
Response
Full agonist
Partial agonist
Neutral antagonist
Inverse agonist
Constitutive activity
Click to add notes
Slide 17 of 135
"Textured"
80%
9:08 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

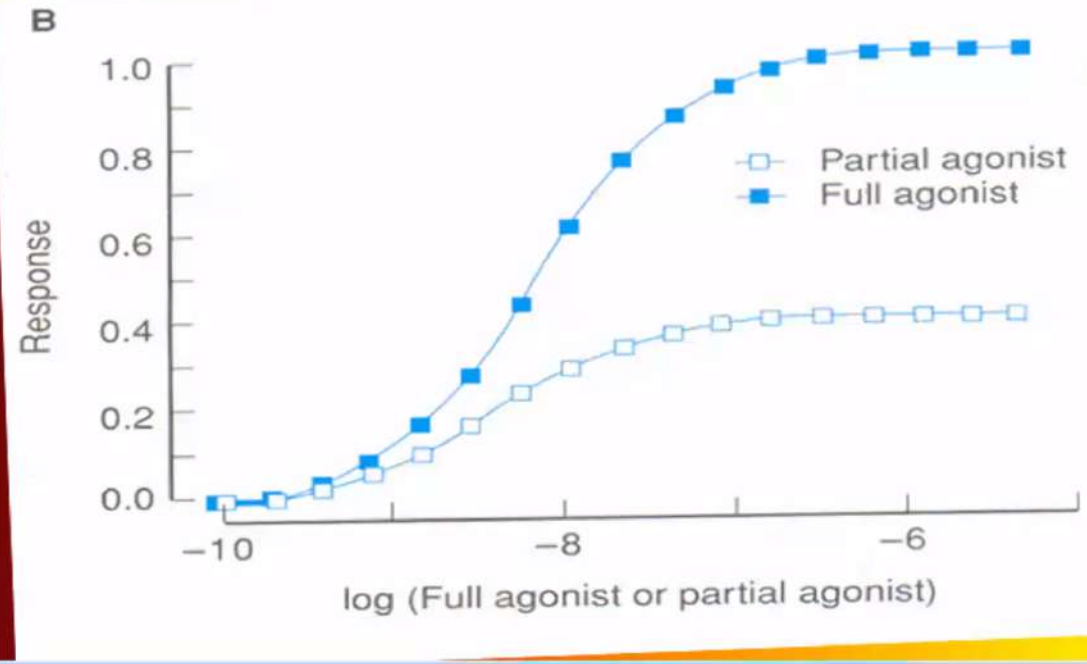
Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

13 14 15 16 17 18 19

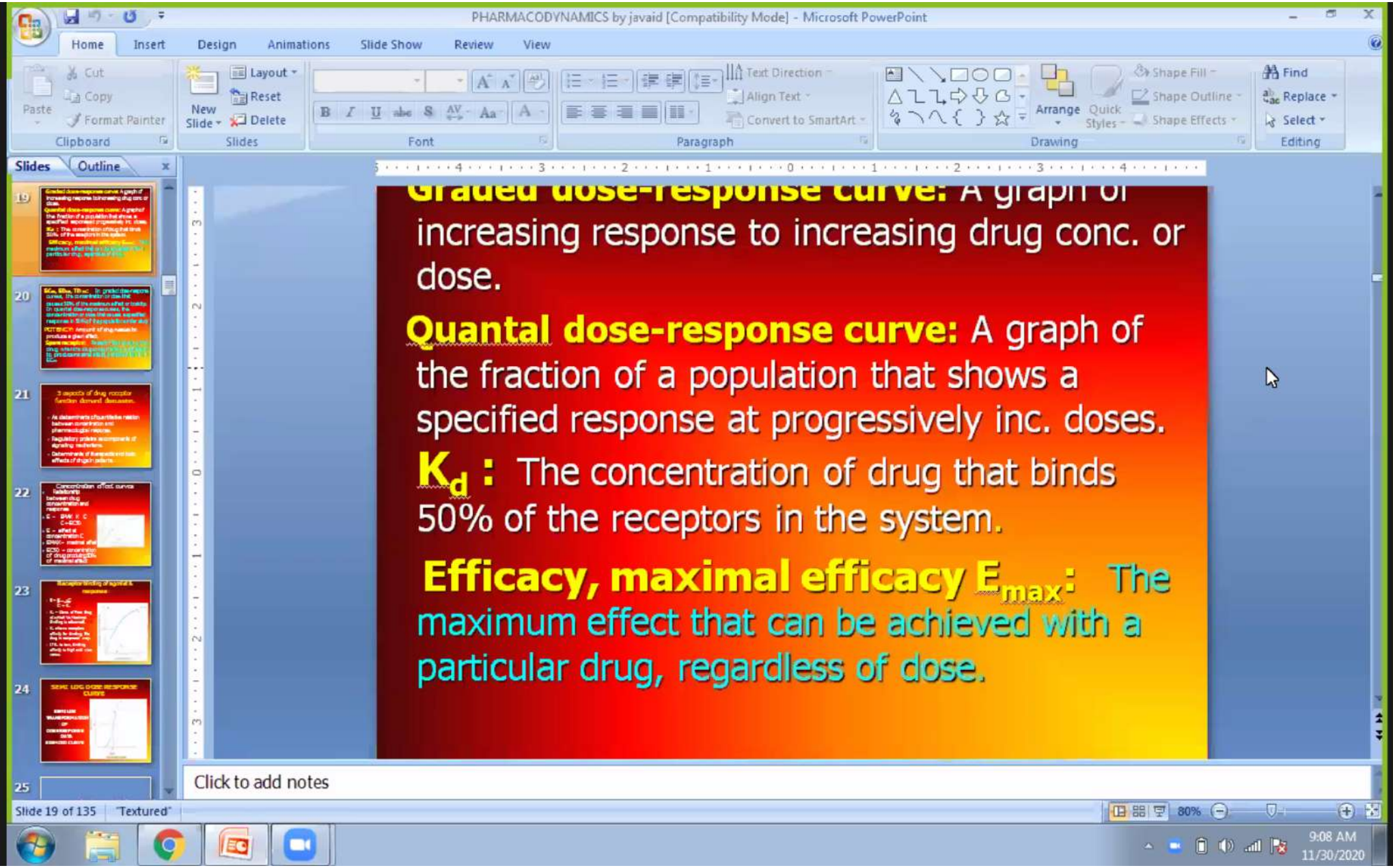
Response with a partial agonist

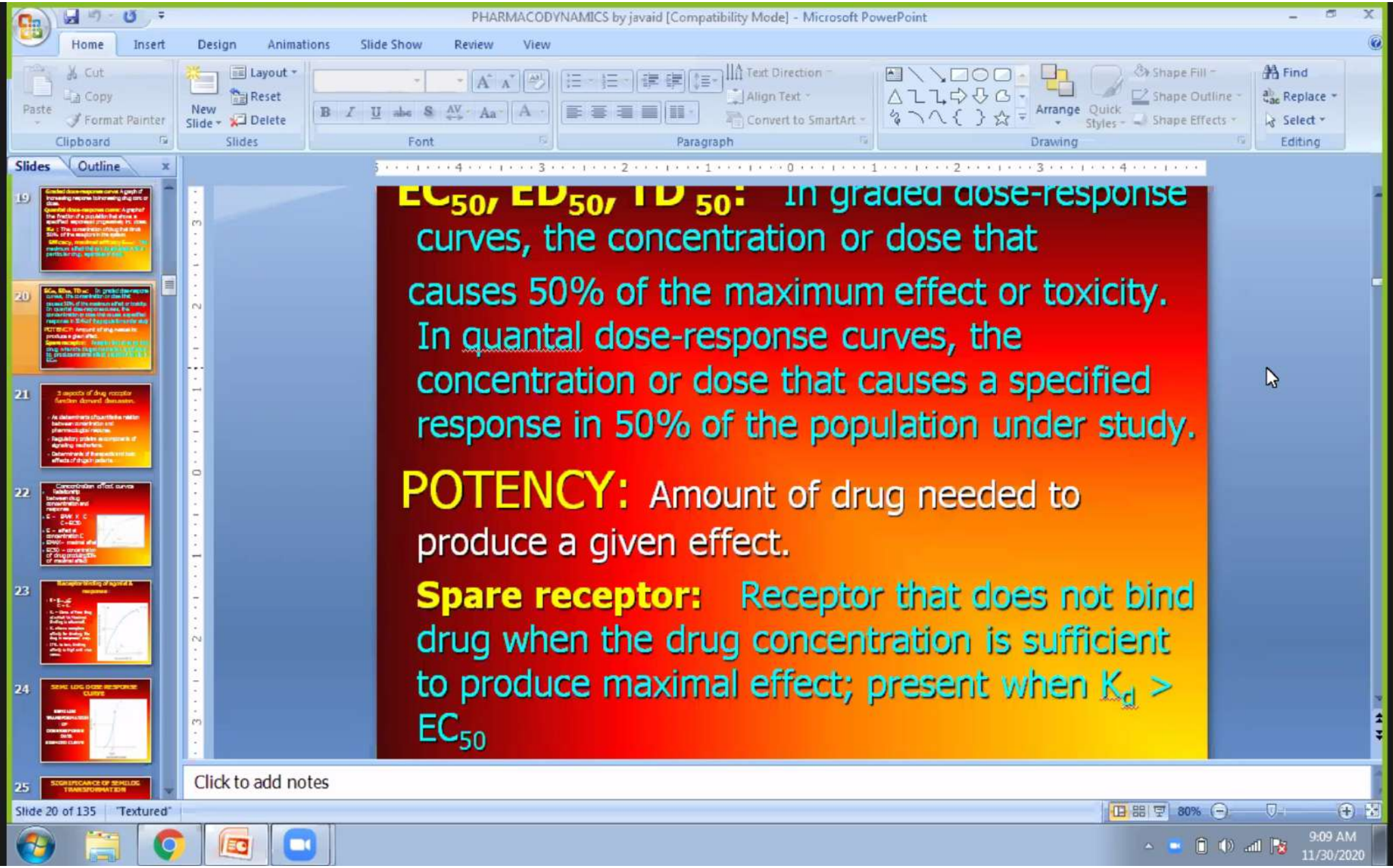


Click to add notes

Slide 18 of 135 "Textured" 80%

9:08 AM 11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
increasing response to increasing drug conc. or dose.
Quantal dose-response curve: A graph of the fraction of a population that shows a specified response at progressively inc. doses.
K_d : The concentration of drug that binds 50% of the receptors in the system.
Efficacy, maximal efficacy E_{max}: The maximum effect that can be achieved with a particular drug, regardless of dose.
Click to add notes
Slide 19 of 135
"Textured"
80%
9:08 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
EC_{50}, ED_{50}, TD_{50}: In graded dose-response curves, the concentration or dose that causes 50% of the maximum effect or toxicity.
In quantal dose-response curves, the concentration or dose that causes a specified response in 50% of the population under study.
POTENCY: Amount of drug needed to produce a given effect.
Spare receptor: Receptor that does not bind drug when the drug concentration is sufficient to produce maximal effect; present when K_d > EC_{50}
Click to add notes
Slide 20 of 135
"Textured"
80%
9:09 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

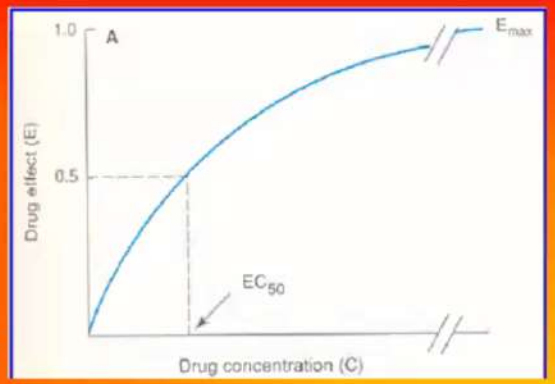
Home Insert Design Animations Slide Show Review View

Slides Outline

19 20 21 22 23 24 25

Concentration effect curves

- Relationship between drug concentration and response
- E = EMAX X C / C + EC50
- E = effect at concentration C
- EMAX= maximal effect
- EC50 = concentration of drug producing 50%



Click to add notes

Slide 20 of 135 "Textured" 80%

9:09 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

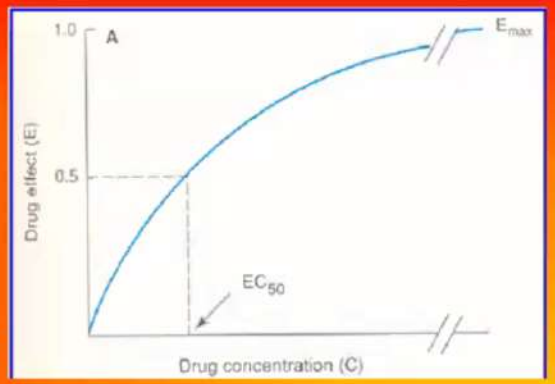
Find Replace Select Editing

Slides Outline

19 20 21 22 23 24 25

Concentration effect curves

- Relationship between drug concentration and response
- E = EMAX X C / C + EC50
- E = effect at concentration C
- EMAX= maximal effect
- EC50 = concentration of drug producing 50%



Click to add notes

Slide 22 of 135 "Textured" 80%

9:09 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home | Insert | Design | Animations | Slide Show | Review | View

Cut | Copy | Format Painter | Paste | Clipboard

New Slide | Layout | Reset | Delete | Slides

Font | Paragraph | Text Direction | Align Text | Convert to SmartArt

Arrange | Quick Styles | Shape Fill | Shape Outline | Shape Effects | Drawing

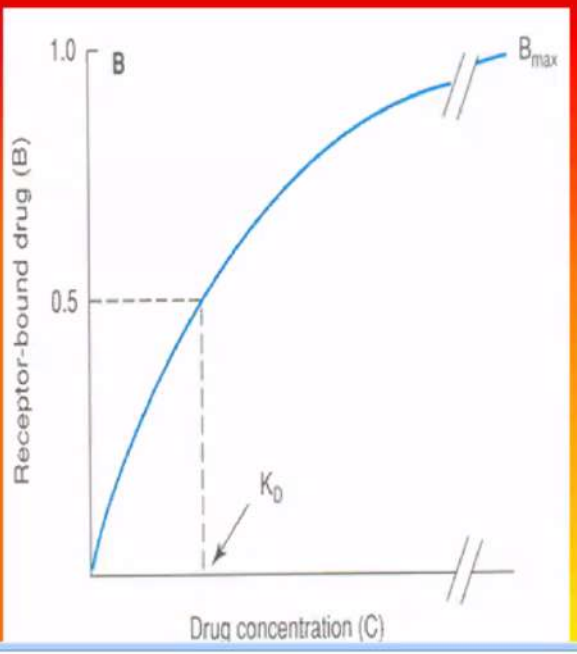
Find | Replace | Select | Editing

Slides | Outline

19 20 21 22 23 24 25

response

- $B = \frac{B_{max} \times C}{C + K_D}$
- K_D = Conc. of Free drug at which ½ Maximal binding is observed.
- K_D shows receptors affinity for binding the drug in reciprocal way.
- If K_D is low, binding affinity is high and vice versa.



Click to add notes

Slide 23 of 135 | "Textured" | 80%

9:09 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

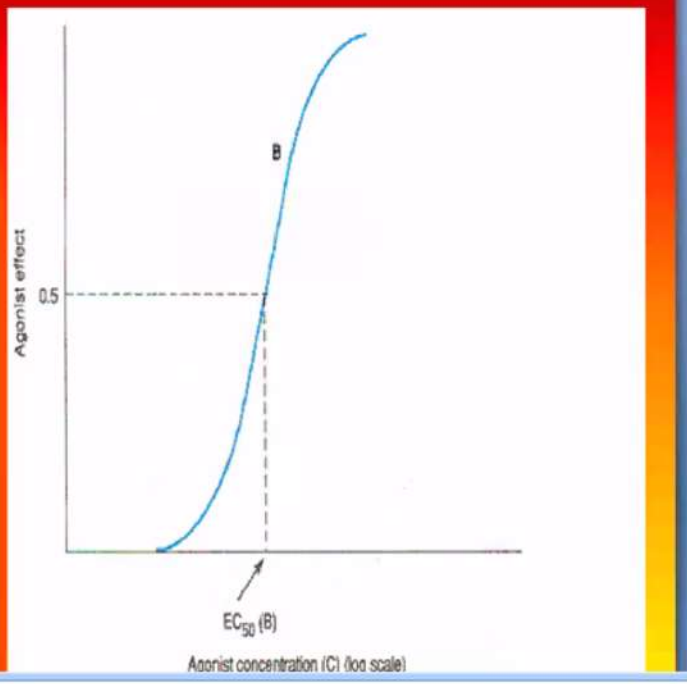
Find Replace Select Editing

Slides Outline

19 20 21 22 23 24 25

SEMI LOG DOSE RESPONSE CURVE

SEMI LOG TRANSFORMATION OF DOSE RESPONSE DATA SIGMOID CURVE



Click to add notes

Slide 24 of 135 "Textured" 80%

9:09 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste — Clipboard

New Slide Layout Reset Delete — Slides

Font — Paragraph — Text Direction Align Text Convert to SmartArt

Arrange Quick Styles Shape Fill Shape Outline Shape Effects — Drawing

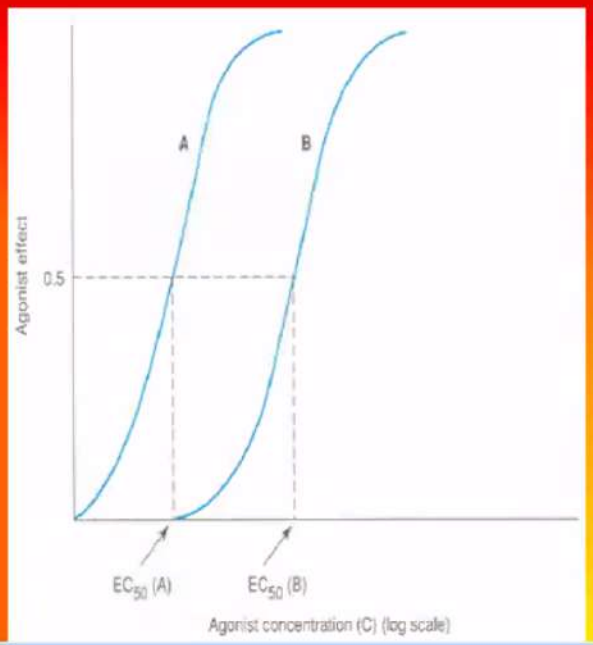
Find Replace Select — Editing

Slides Outline

25 26 27 28 29 30 31

SIGNIFICANCE OF SEMILOG TRANSFORMATION

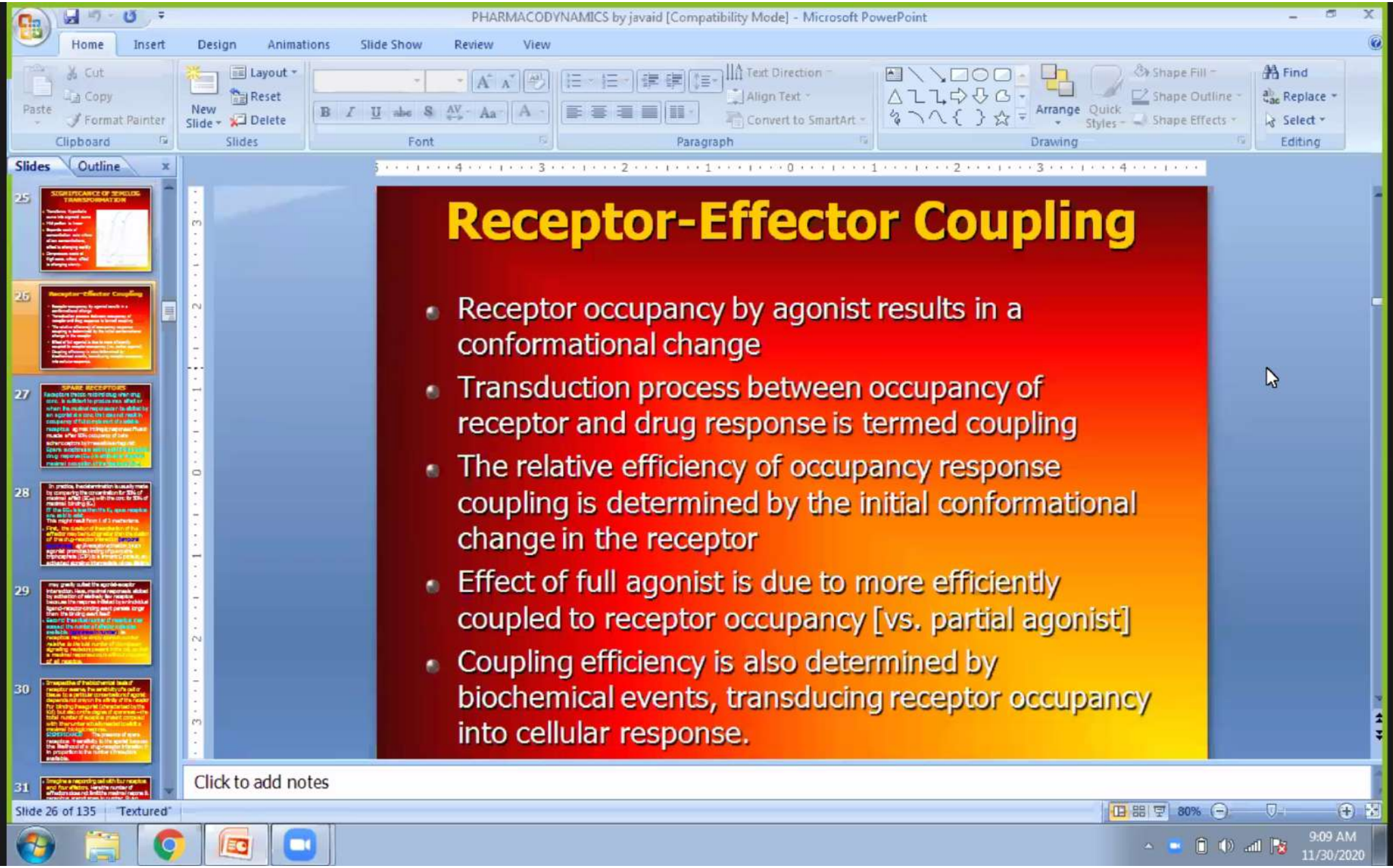
- Transforms hyperbolic curve into sigmoid curve
- Mid portion is linear
- Expands scale of concentration axis where at low concentrations, effect is changing rapidly
- Compresses scale at high conc. where effect is changing slowly.

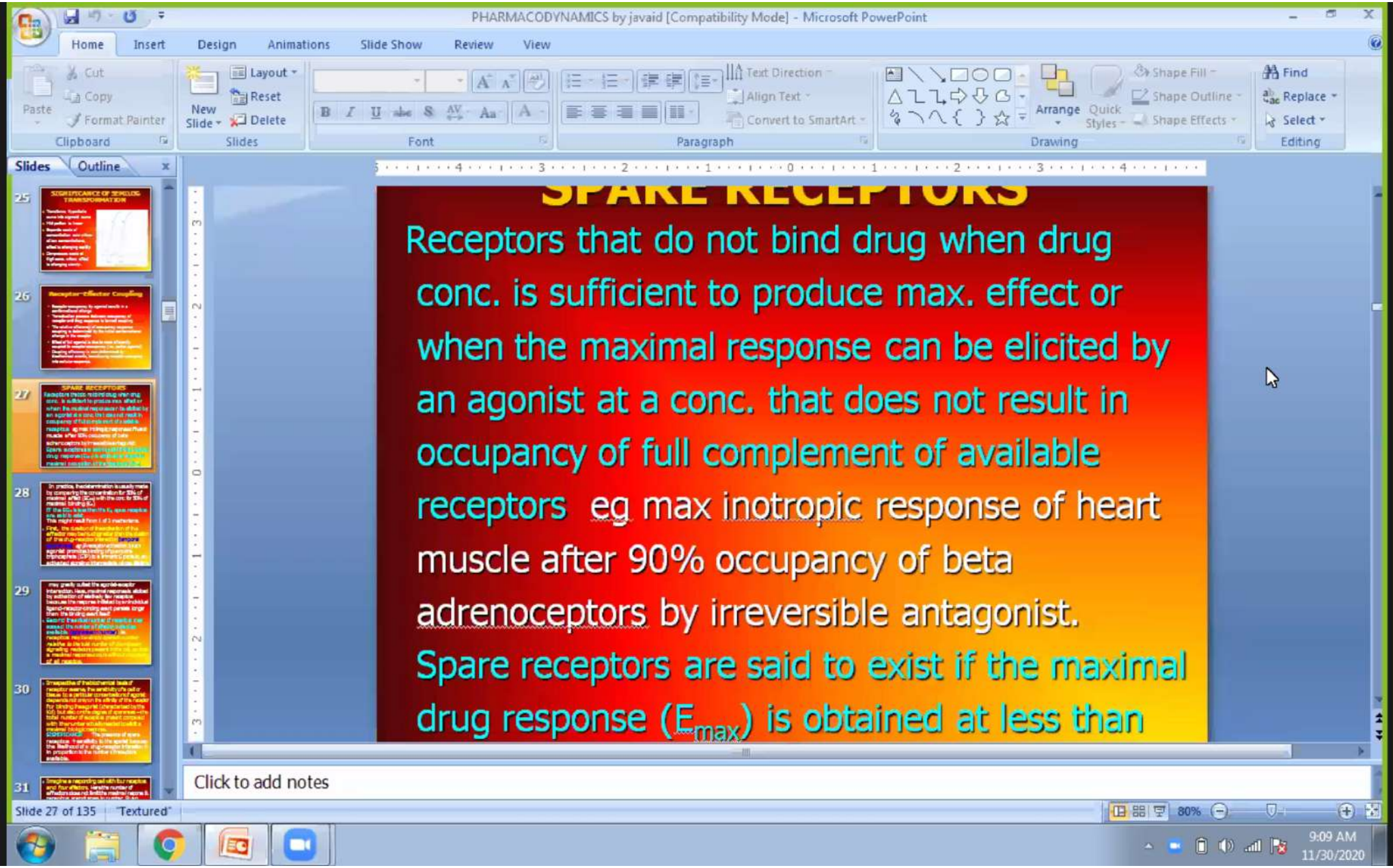


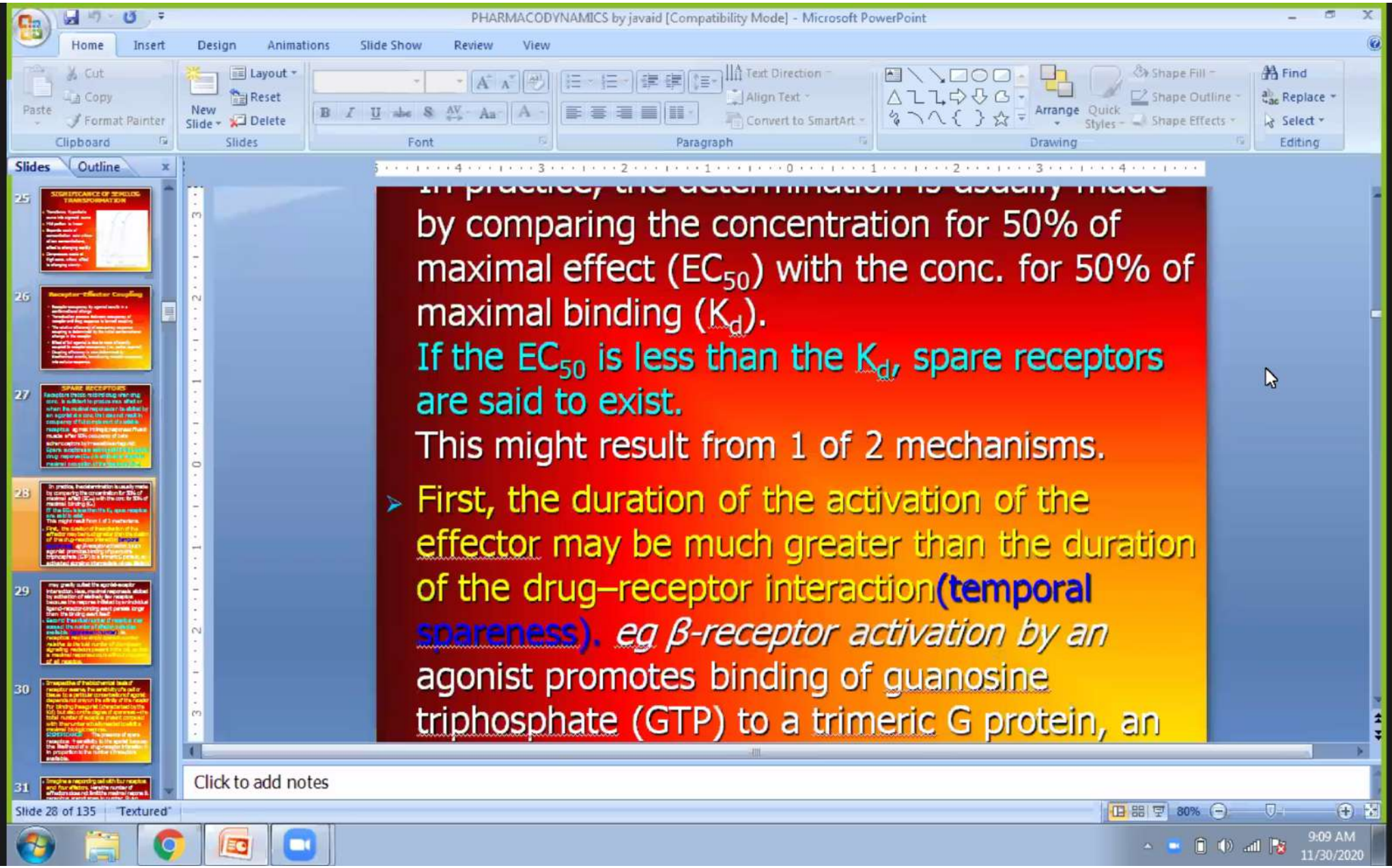
Click to add notes

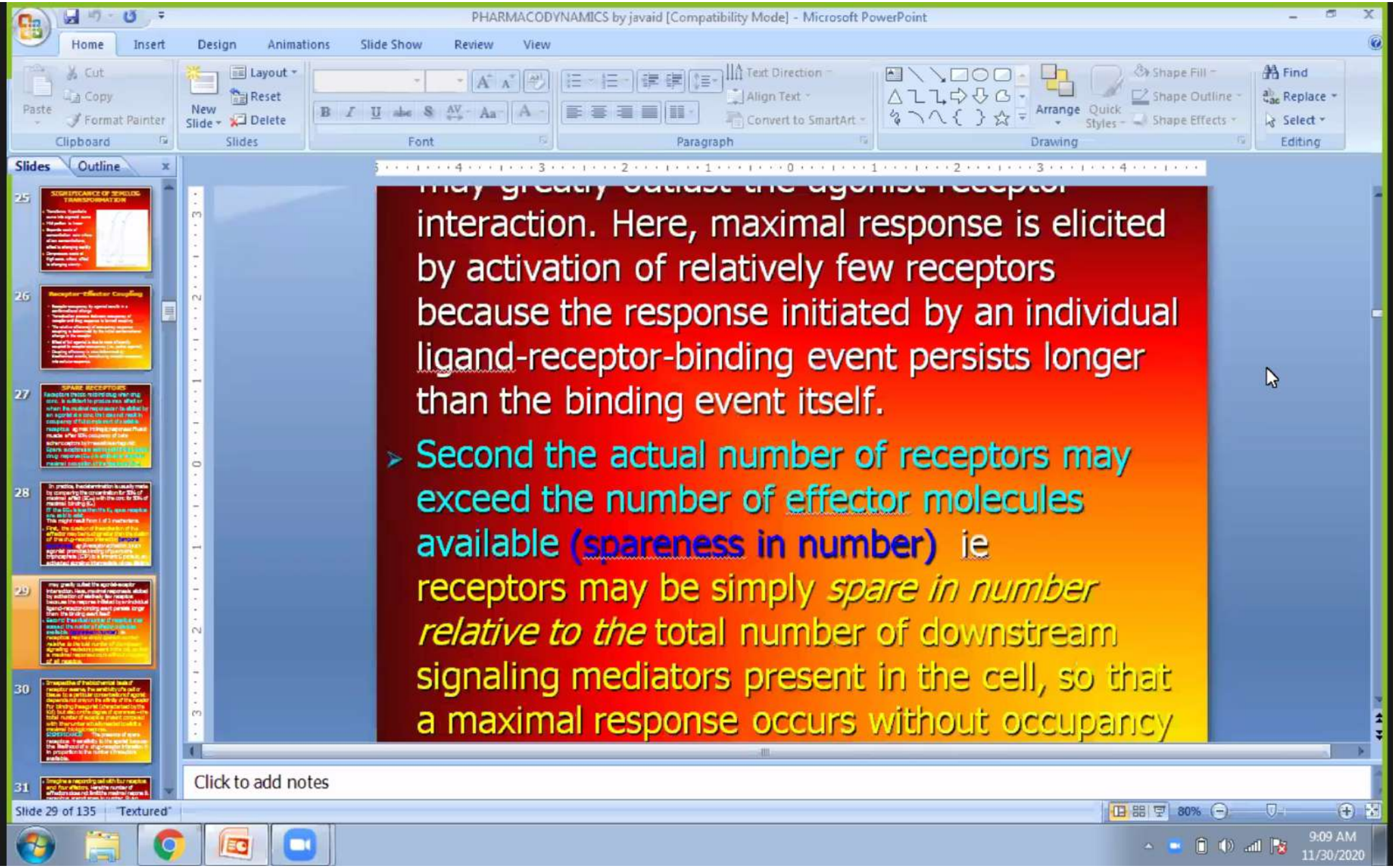
Slide 25 of 135 "Textured" 80%

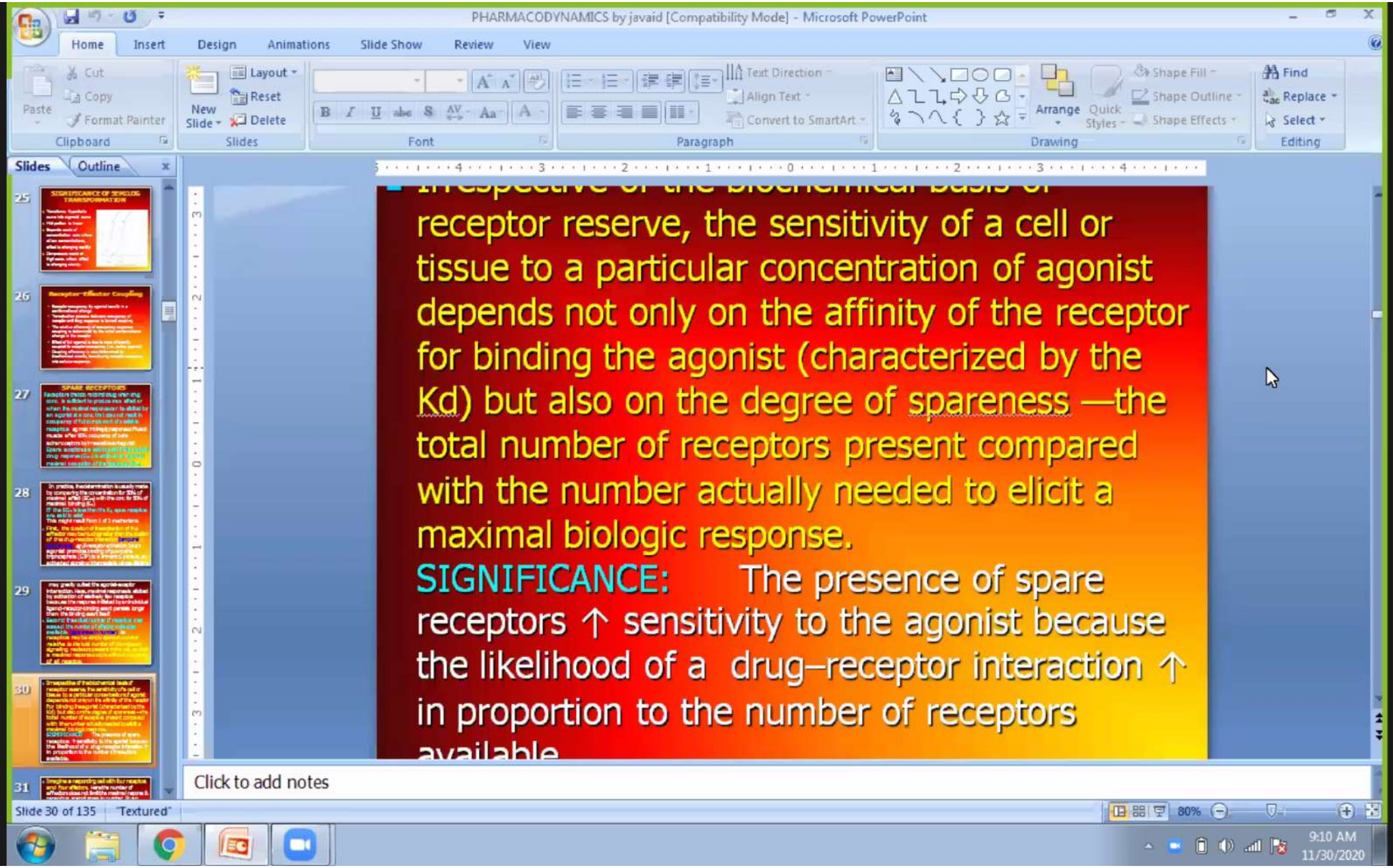
9:09 AM 11/30/2020

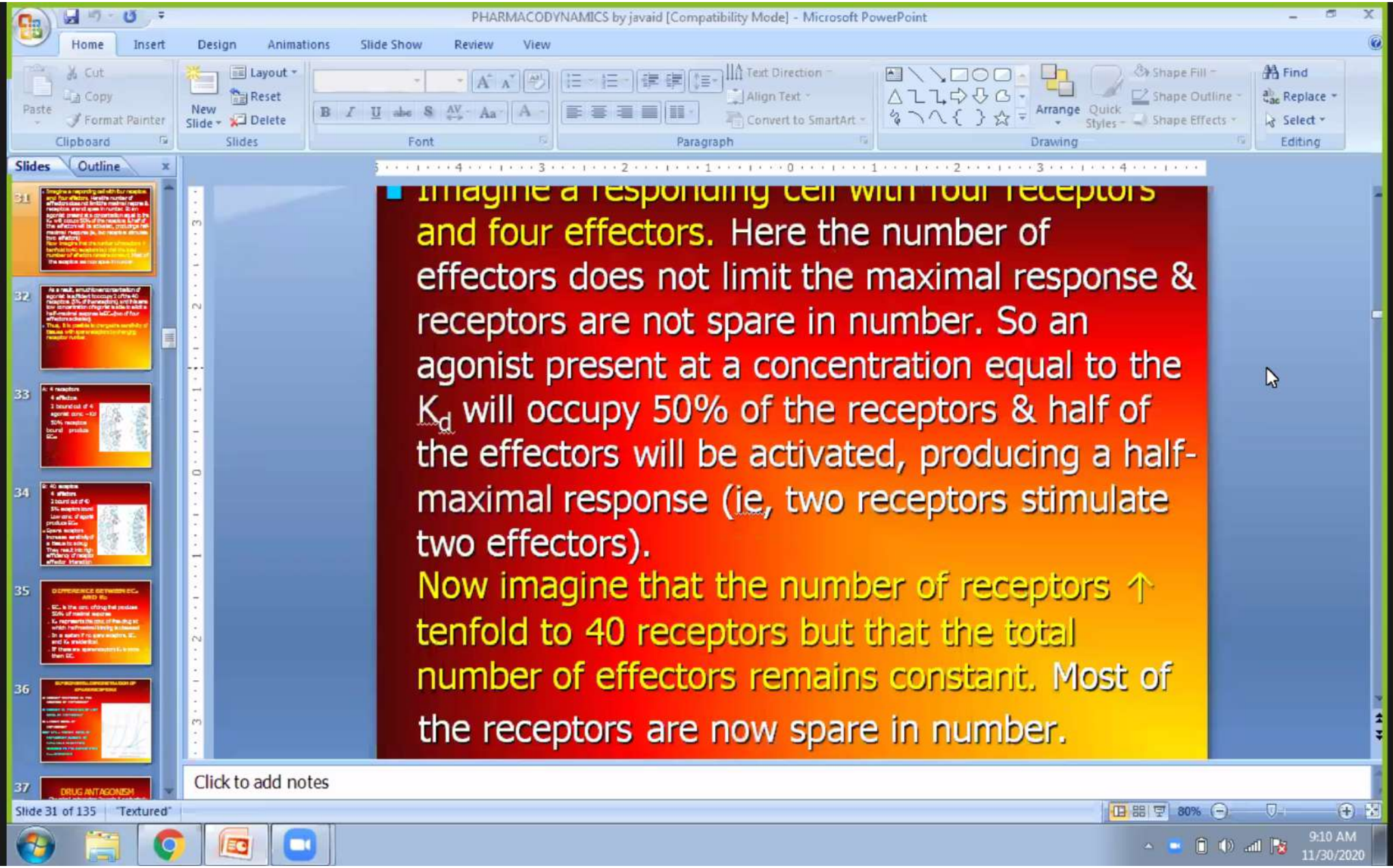

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
Receptor-Effector Coupling
Receptor occupancy by agonist results in a conformational change
Transduction process between occupancy of receptor and drug response is termed coupling
The relative efficiency of occupancy response coupling is determined by the initial conformational change in the receptor
Effect of full agonist is due to more efficiently coupled to receptor occupancy [vs. partial agonist]
Coupling efficiency is also determined by biochemical events, transducing receptor occupancy into cellular response.
Click to add notes
Slide 26 of 135
"Textured"
80%
9:09 AM
11/30/2020

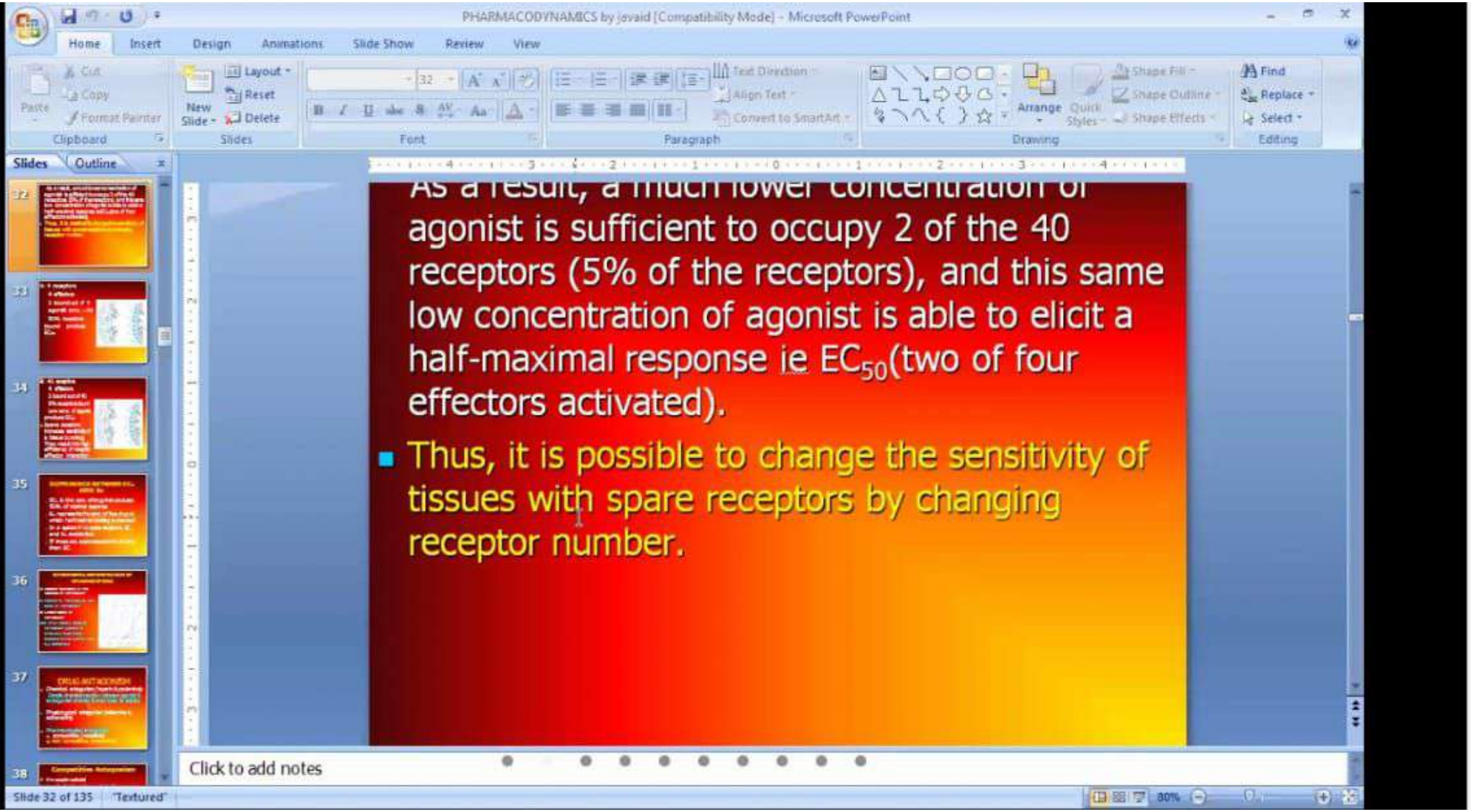

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
SPARE RECEPTORS
Receptors that do not bind drug when drug conc. is sufficient to produce max. effect or when the maximal response can be elicited by an agonist at a conc. that does not result in occupancy of full complement of available receptors eg max inotropic response of heart muscle after 90% occupancy of beta adrenoceptors by irreversible antagonist.
Spare receptors are said to exist if the maximal drug response (E_{max}) is obtained at less than
Click to add notes
Slide 27 of 135
"Textured"
80%
9:09 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
by comparing the concentration for 50% of maximal effect (EC_{50}) with the conc. for 50% of maximal binding (K_d).
If the EC_{50} is less than the K_d, spare receptors are said to exist.
This might result from 1 of 2 mechanisms.
First, the duration of the activation of the effector may be much greater than the duration of the drug–receptor interaction (temporal spareness). eg β-receptor activation by an agonist promotes binding of guanosine triphosphate (GTP) to a trimeric G protein, an
Click to add notes
Slide 28 of 135
"Textured"
80%
9:09 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
interaction. Here, maximal response is elicited by activation of relatively few receptors because the response initiated by an individual ligand-receptor-binding event persists longer than the binding event itself.
Second the actual number of receptors may exceed the number of effector molecules available (spareness in number) ie receptors may be simply spare in number relative to the total number of downstream signaling mediators present in the cell, so that a maximal response occurs without occupancy
Click to add notes
Slide 29 of 135
"Textured"
80%
9:09 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
receptor reserve, the sensitivity of a cell or tissue to a particular concentration of agonist depends not only on the affinity of the receptor for binding the agonist (characterized by the Kd) but also on the degree of spareness —the total number of receptors present compared with the number actually needed to elicit a maximal biologic response.
SIGNIFICANCE: The presence of spare receptors ↑ sensitivity to the agonist because the likelihood of a drug–receptor interaction ↑ in proportion to the number of receptors
Click to add notes
Slide 30 of 135
"Textured"
80%
9:10 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
Imagine a responding cell with four receptors and four effectors. Here the number of effectors does not limit the maximal response & receptors are not spare in number. So an agonist present at a concentration equal to the K_d will occupy 50% of the receptors & half of the effectors will be activated, producing a half-maximal response (ie, two receptors stimulate two effectors).
Now imagine that the number of receptors ↑ tenfold to 40 receptors but that the total number of effectors remains constant. Most of the receptors are now spare in number.
Click to add notes
Slide 31 of 135
"Textured"
80%
9:10 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
As a result, a much lower concentration of agonist is sufficient to occupy 2 of the 40 receptors (5% of the receptors), and this same low concentration of agonist is able to elicit a half-maximal response ie EC_{50}(two of four effectors activated).
Thus, it is possible to change the sensitivity of tissues with spare receptors by changing receptor number.
Click to add notes
Slide 32 of 135
'Textured'

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

31 32 33 34 35 36 37

A: 4 receptors

4 effectors

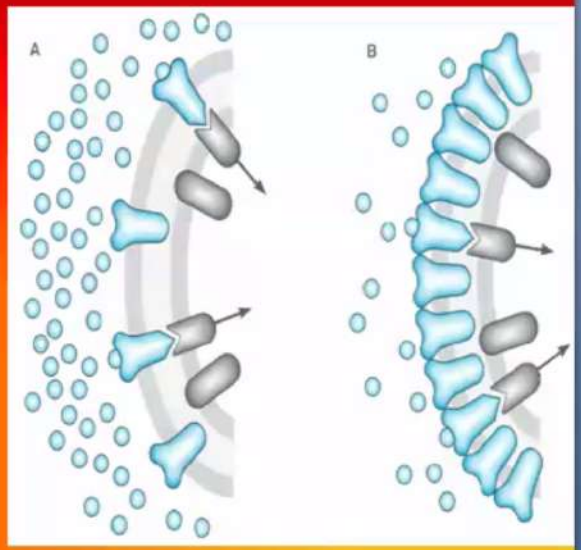
2 bound out of 4

agonist conc. =Kd

50% receptors

bound produce

EC_{50}



Click to add notes

Slide 31 of 135 "Textured" 80%

9:10 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

31 32 33 34 35 36 37

B. 40 receptors

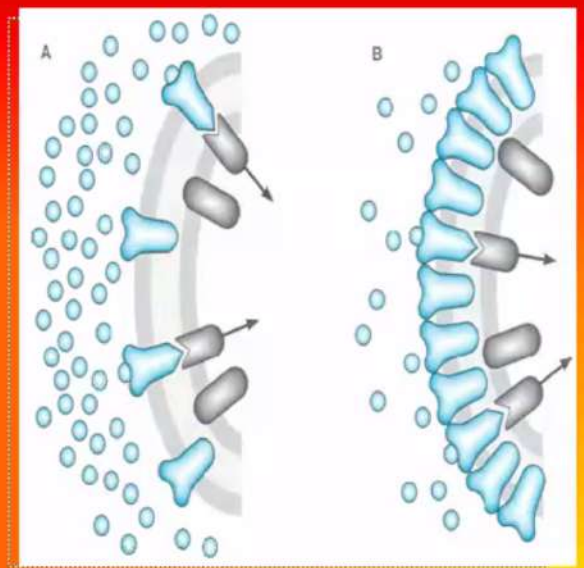
4 affectors

2 bound out of 40

5% receptors bound

Low conc. of agonist produce EC_{50}

- Spare receptors increase sensitivity of a tissue to a drug. They result into high efficiency of receptor



Click to add notes

Slide 34 of 135 "Textured" 80%

9:10 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

31 32 33 34 35 36 37

DIFFERENCE BETWEEN EC_{50} AND K_D

- EC_{50} is the conc. of drug that produces 50% of maximal response
- K_D represents the conc. of free drug at which half maximal binding is observed
- In a system if no spare receptors, EC_{50} and K_D are identical.
- If there are spare receptors K_D is more than EC_{50}

Click to add notes

Slide 35 of 135 "Textured" 80%

9:10 AM 11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste | Clipboard | New Slide Layout Reset Delete | Slides | Font | Text Direction Align Text Convert to SmartArt | Paragraph | Arrange Quick Styles Shape Fill Shape Outline Shape Effects | Drawing | Find Replace Select | Editing

Slides Outline

31 32 33 34 35 36 37

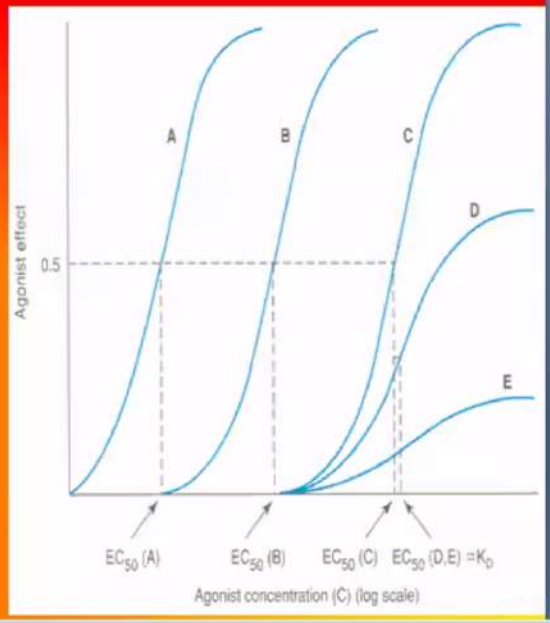
EXPERIMENTAL DEMONSTRATION OF SPARE RECEPTORS

A: AGONIST RESPONSE IN THE ABSENCE OF ANTAGONIST

B: AGONIST IN PRESENSE OF LOW CONC. OF ANTAGONIST

C: LARGER CONC. OF ANTAGONIST

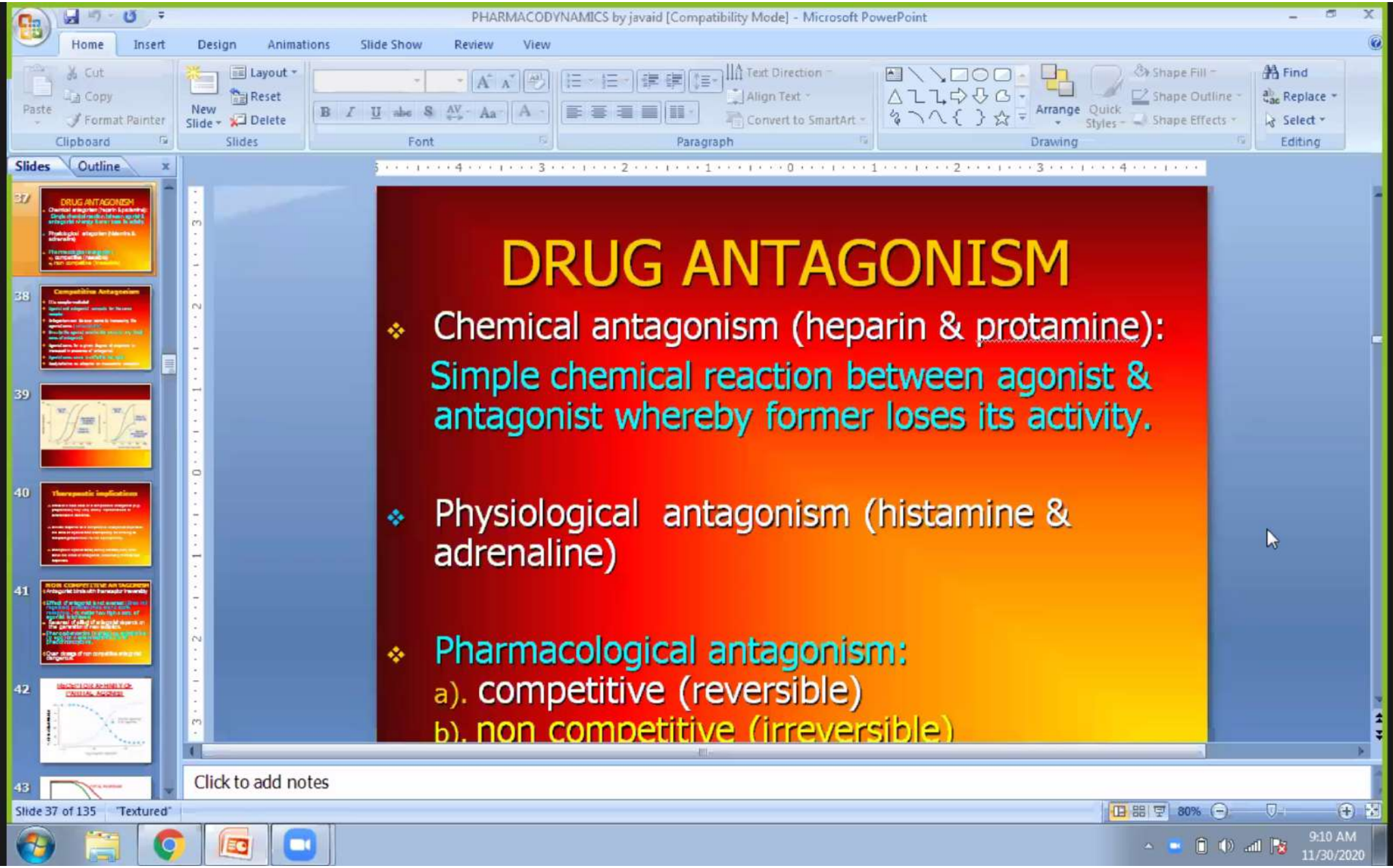
D&E: STILL HIGHER CONC. OF ANTAGONIST,NUMBER OF AVAILABLE RECEPTORS REDUCED TO THE EXTENT THAT E_{MAX} DIMINISHED



Click to add notes

Slide 36 of 135 "Textured" 80%

9:10 AM 11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
DRUG ANTAGONISM
Chemical antagonism (heparin & protamine):
Simple chemical reaction between agonist & antagonist whereby former loses its activity.
Physiological antagonism (histamine & adrenaline)
Pharmacological antagonism:
a). competitive (reversible)
b). non competitive (irreversible)
Click to add notes
Slide 37 of 135
"Textured"
80%
9:10 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

37 DRUG ANTAGONISM

38 Competitive Antagonism

39

40 Therapeutic Implications

41

42

43

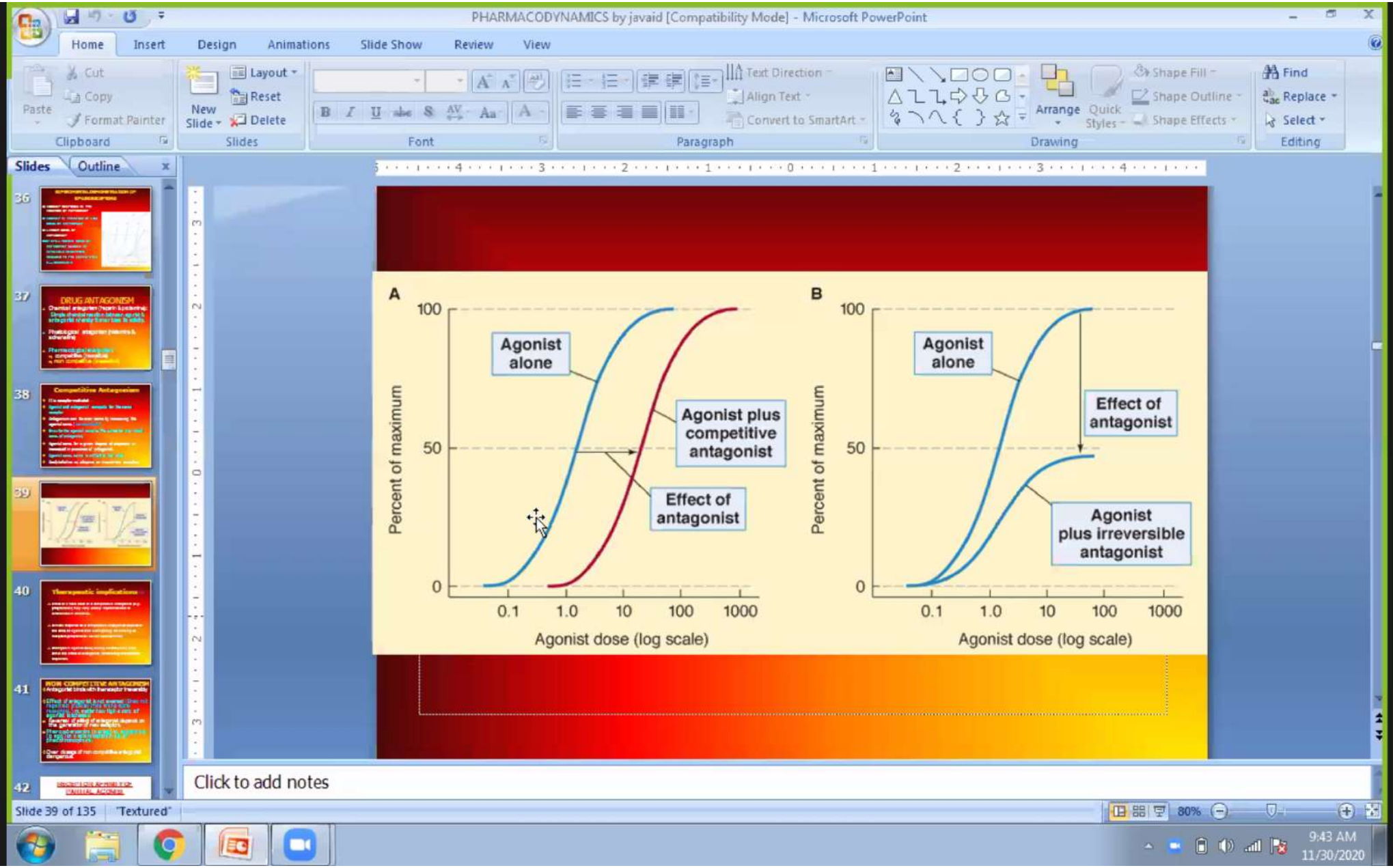
Competitive Antagonism

- It is receptor mediated
- Agonist and antagonist compete for the same receptor
- Antagonism can be over come by increasing the agonist conc. (surmountable)
- E_{max} for the agonist remains the same for any fixed conc. of antagonist.
- Agonist conc. for a given degree of response is increased in presence of antagonist.
- Agonist conc. curve is shifted to the right.
- Acetylcholine vs. atropine on muscarinic receptors

Click to add notes

Slide 38 of 135 "Textured" 80%

9:33 AM 11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
A
Agonist alone
Agonist plus competitive antagonist
Effect of antagonist
Percent of maximum
100
50
0
0.1
1.0
10
100
1000
Agonist dose (log scale)
B
Agonist alone
Effect of antagonist
Agonist plus irreversible antagonist
Percent of maximum
Agonist dose (log scale)
Click to add notes
Slide 39 of 135
"Textured"
80%
9:43 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

32 Font

Text Direction Align Text Convert to SmartArt Paragraph

Arrange Quick Styles Shape Fill Shape Outline Shape Effects Drawing

Find Replace Select Editing

Slides Outline

39 40 41 42 43 44 45

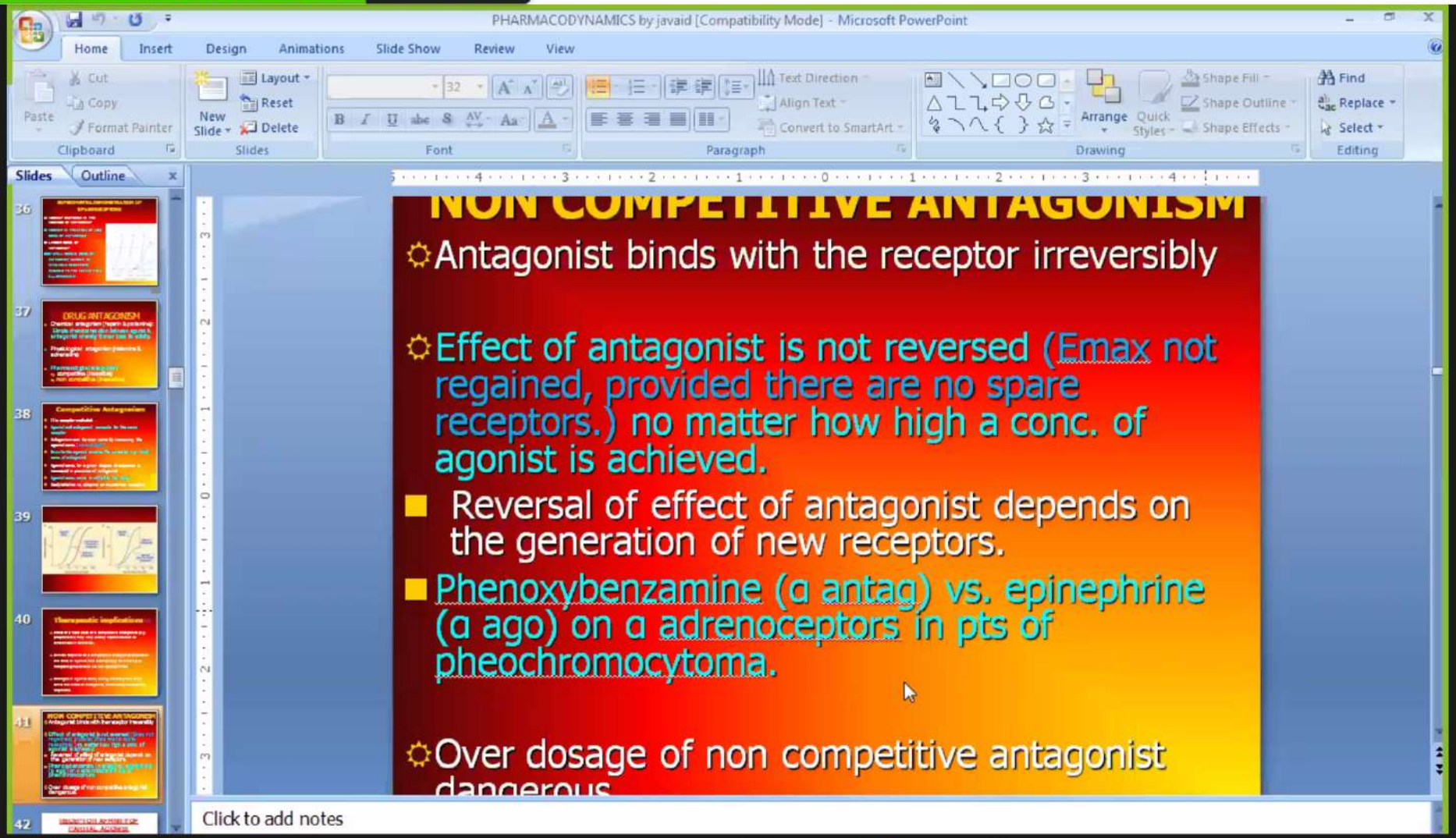
Therapeutic implications

- Effect of a fixed dose of a competitive antagonist (e.g. propranolol) may vary widely in patients due to differences in clearance.
- Clinical response to a competitive antagonist depends on the conc. of agonist that is competing for binding to receptors (propranolol vs. nor epinephrine).
- Changes in agonist conc.(during exercise) may over come the effect of antagonist, influencing therapeutic

Click to add notes

Slide 39 of 135 "Textured" 80%

9:52 AM 11/30/2020

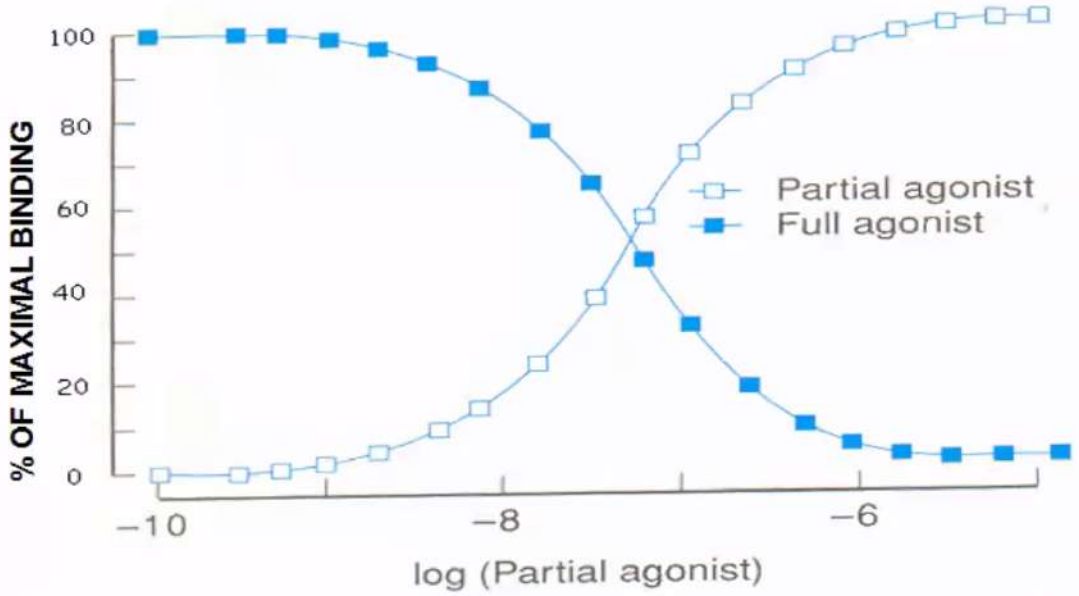


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Slides Outline

RECEPTOR AFFINITY OF PARTIAL AGONIST

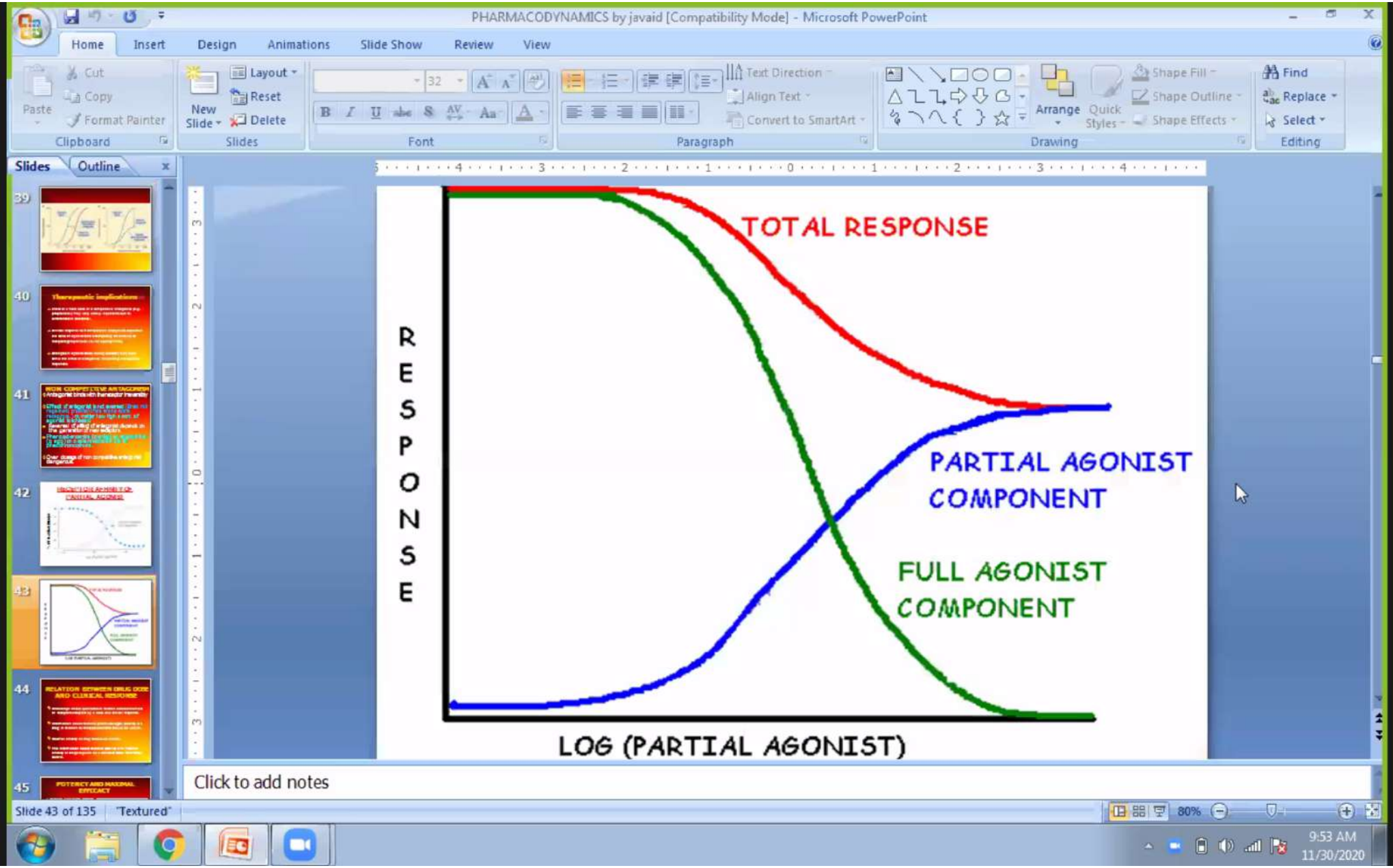


Click to add notes

Slide 42 of 135 "Default Design"

80%

9:53 AM
11/30/2020


PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Slides
Outline
TOTAL RESPONSE
PARTIAL AGONIST COMPONENT
FULL AGONIST COMPONENT
RESPONSE
LOG (PARTIAL AGONIST)
Click to add notes
Slide 43 of 135
"Textured"
80%
9:53 AM
11/30/2020

PHARMACODYNAMICS by javaid [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View

Cut Copy Format Painter Paste Clipboard

New Slide Layout Reset Delete Slides

Font Paragraph Drawing Editing

Text Direction Align Text Convert to SmartArt

Arrange Quick Styles Shape Fill Shape Outline Shape Effects

Find Replace Select

Slides Outline

39 40 41 42 43 44 45

RELATION BETWEEN DRUG DOSE AND CLINICAL RESPONSE

- Knowledge about quantitative relation between number of receptors occupied by a dose and clinical response.
- Information about relative pharmacological potency of a drug in relation to therapeutic effect should be known.
- Maximal efficacy of drug should be known.
- The information about relative potency and maximal efficacy of drugs is given by a GRADED DOSE RESPONSE CURVE

Click to add notes

Slide 44 of 135 "Textured" 80%

9:53 AM 11/30/2020