Degradation Properties of Beta-Lactamases

*Grey portions are what they degrade (do not use), white are what they are sensitive too

Beta-Lactamase Type	Organisms Affected	Penicillin	1st gen Ceph	2nd Gen Ceph	cefoxitin	3rd gen Ceph	4th gen Ceph	Cefiderocol	Aztreonam	Carbapenems	Clavulanate Inhibits Class A	Sulbactam Inhibits Class A	Tazobactam Inhibits Class A	Avibactam Class Inhibits class A (most KPC), C, and Some D (OXA-48)	Vaborbactam Class Inhibits Class A (KPC), Class C (AmpC)	Relebactam Inhibits Class A, C	Durlobactam Inhibits Class A,C,D
Penicillinase	*E. coli, Klebsiella spp., Enterobacter spp.*																
Ambler Class A (TEM, SHV) - Serine Active Site	*E. coli, Klebsiella spp., Enterobacter spp*																
Ambler Class D Oxacillinases (OXA) - Serine Active Site	*Acinetobacter, Pseudomonas*																
Ambler Class C Cephalosporinases (AmpC) - Serine Active Site	*Enterobacter spp., Serratia spp., Citrobacter spp., Providencia spp., Pseudomonas spp., Acinetobacter spp.*					**Avoid ceftriaxone and ceftazidime even if listed as susceptible**	**if cefepime mic>4, carbapenem preferred**		**Reduced sensitivity**								
Ambler Class A ESBLs (CTX-M, TEM-Type, SHV-Type) - Serine Active Site	*E. coli, Klebsiella spp., Enterobacter spp*					**Ceftazidime not always hydrolyzed**	**Cefepime not hydrolyzed**										
Ambler Class D Carbapenemase (OXA-48, OXA-23) - Serine Active Site	*Acinetobacter, Pseudomonas*					**Ceftazidime not always hydrolyzed**	**Cefepime not always hydrolyzed**										
Ambler Class A Carbapenemases (KPC, GES, SME, IMI/NMC-A, SHV38, SFC-1) - Serine Active Site	*E. coli, Klebsiella spp., Enterobacter spp*											**Some combos**	**ceftolozane-tazobactam is not effective**			**restores imipenem susceptibility to *P. aeruginosa***	
Ambler Class B metallo-β-lactamases (VIM, IMP, NDM) - Zinc Active SIte	*E. coli, Klebsiella spp., Enterobacter spp*													**Aztreonam + ceftazidime/avibactam has coverage**			