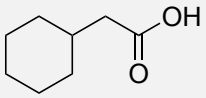
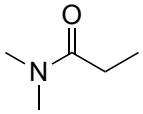
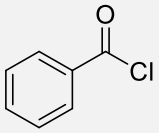
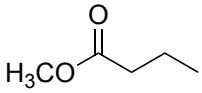
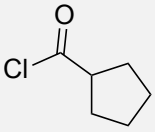
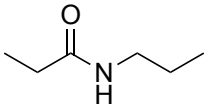
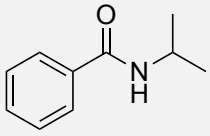
Chapter 22 Homework – Carboxylic Acids & Friends

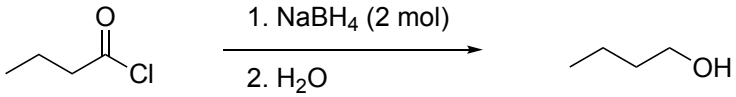
20A. HYDROGEN & OXYGEN NUCLEOPHILES.
Draw the product of each reaction: **starting material + reagent → Product.**

	Starting Material	Reagents *& translation*	Draw the Product
1		**1. xs $LiAlH_4$** **2. H_2O** *Excess lithium aluminum* ***hydride,*** *followed by water*	
2		**1. xs $LiAlH_4$** **2. H_2O**	
3		**xs $NaBH_4$, MeOH** *sodium boro****hydride*** *in methanol*	
4		**1. xs $LiAlH_4$** **2. H_2O**	Draw both organic products
5		**H_3O^+, Δ** *Aqueous acid and heat*	
6		**H_3O^+, Δ**	Draw both organic products
7		**H_3O^+, Δ**	Draw both organic products

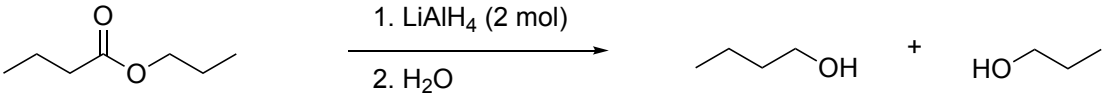
22B. Mechanisms – Acid Derivatives with hydrogen and oxygen nucleophiles.

- Draw the arrow-pushing mechanism for each reaction, including all charged intermediates and product.

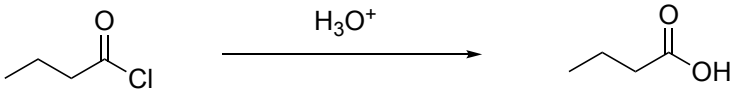
8. Acid chloride reduction with excess LAH



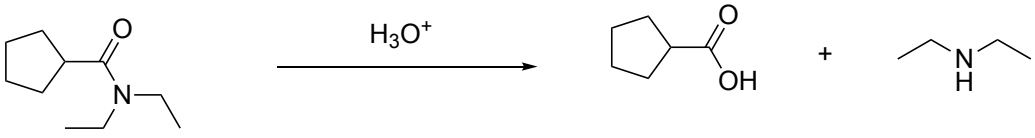
9. Ester reduction with excess LAH



10. Acid chloride hydrolysis

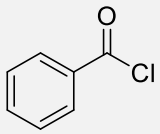
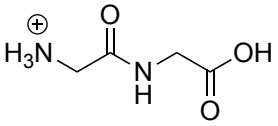
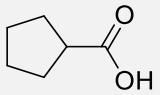
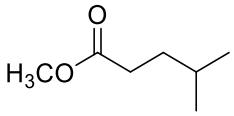
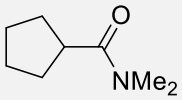
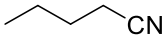


11. Amide hydrolysis



22C. Nucleophilic Acyl Substitution – Mix & Match with Reaction Bootcamp!

- Draw the product(s) of each reaction: **starting material + reagent → Product(s)**
- **Look out for "No Reaction"** – when the reagent does not react with the starting material

	React each molecule with each reagent and draw the product in the box	**xs $NaBH_4$, MeOH**	**H_3O^+**	**1. xs $LiAlH_4$ 2. H_2O**
12				
13	 dipeptide			
14				
15				
16				
17			SKIP - reaction not covered in 8B	