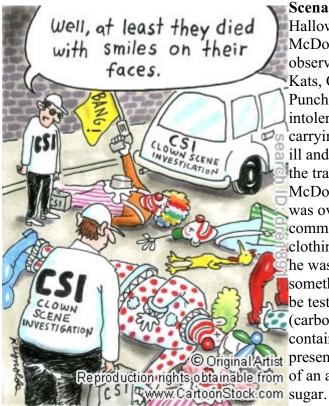# Ronald McDonald's Rivalry

Scenario: Silly Sally arrived home from a Halloween party that was thrown for Ronald McDonald. While at the party, Silly Sally was observed eating tons of Halloween candy (Kit-Kats, Candy Pumpkins, 3 Musketeers, Twix, Sour Punch Straws, etc. which she is glucose intolerant). Upon arriving home, Silly Sally was carrying a tray to the sink when she fell violently ill and started vomiting. When she was found, the tray contained her last meal. Ronald McDonald is considered a suspect because he was overheard at the party making haste comments about Sally's outfit being the new clothing attire for McDonalds. Witnesses claimed he was jealous of Silly Sally's costume and put something in her candy. The vomit will need to be tested for what macromolecules (carbohydrates, proteins, and lipids) her last meal contained, as well as any poisons that may be present in the vomit indicating a homicide instead of an accidental death due to an overdose on sugar.

Procedure:
1. Obtain a vomit sample into a beaker.
2. Place 10mL vomit sample each into 5 test tubes, observe physical traits (include colors, textures, odors, consistencies, identifiable food items)
3. Perform each specific molecule test.
4. Cut the procedure and table out and record results in journal. (Title, Purpose, Procedure, Data, Questions- answer in complete sentences)

A. Grease Spot Test – Lipids
1. From the beaker of vomit, pipet 5 drops of vomit in the center of the paper bag square.
2. Allow to dry for 5 minutes.
3. Hold up to light source.
4. Lipids render the bag transparent; otherwise the bag is simply wet.

B. Iodine Test – Carbohydrates
1. Obtain 10mL of vomit sample in test tube.
2. Add 10 drops of Iodine solution.
3. Shake gently.
4. Dark purple is a positive test. Reddish-orange color indicates no carbohydrates are present.

C. Benedict's Solution- Sugar test
Background-Benedict's Solution is a clear blue solution of sodium and copper salts which indicates the presence of simple sugars such as glucose. Sugar causes the Benedict's solution to change from green, yellow, brick red.
1. Mix 10mL vomit with 20mL water in a test tube. Swirl gently.
2. Add 10 drops of Benedict's solution.
3. Place test tube in a beaker of half filled water, then place on hot plate. Heat in a water bath for 5-10 minutes (40-50 degrees Celsius).
4. Orange-yellow to Brick red indicates a high concentration of sugars. Blue indicates no sugar present.

D. Biuret Solution- Protein Test
1. Add 40 drops of water solution to a 10mL vomit-filled test tube.
2. Add 8 drops of Biuret.
3. Shake gently to mix.
4. Positive solution turns lavender when protein is present. Blue indicates no protein present.

E. Sudan IV stain- Fat test
1. Add 10mL of water to a new vomit test tube.
2. Add 5 drops of Sudan IV stain.
3. Shake gently.
4. Fat cells will stain red, separate out and float on water if present. If no fat is present, the color will be evenly distributed.

F. Universal Indicator- Poison
1. Add 10mL of vomit in a dry, clean test tube.
2. Add 6 drops of universal indicator.
3. Orange-red color indicates the presence of poison. Blue-green color indicates no poison present.

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Data Table:
Describe the physical traits of the vomit:

TEST TYPE	Macromolecule Being Analyzed	Color of Reaction After Chemical Added	POSITIVE (+)	NEGATIVE (-)
Grease Spot		N/A		
Iodine Test				
Benedict's Test				
Biuret Solution				
Sudan III Stain				
Universal Indicator				

Questions:
1. **Assume that the person ate their last meal in a restaurant. What sort of restaurant would serve this type of meal based on the macromolecules present?**

2. **Did any of your samples present evidence of alcohol or drugs?**

3. **How could you tell how long ago the meal was ingested?**

4. **Was Silly Sally poisoned or did she die from an overdose on sugar? Use your data to defend your answer.**