**Crystallization Worksheet Answer Key**

1. List some common examples of crystals found in nature.

Examples: Rock salt, table salt, diamonds and gemstones, snowflakes, proteins, sugar (such as rock candy), malaria parasites (hemozoin), insulin

1. What drives crystal growth?

Supersaturation

1. Draw the surface of a crystal face. Where would a drug molecule bind to inhibit crystal growth?

A drug molecule would bind to the kink sites to block further crystal growth.

**ledge**

**terrace**

**kink**

**terrace vacancy**

**step**

**drug
molecule**

1. What are the four types of kidney stones?

Calcium oxalate, cystine, struvite and uric acid.

1. What must be considered when designing new drugs?

*Efficacy*: full inhibition of crystal growth

*Potency*: small amount of drug causes full inhibition

*Cost*: feasibility to manufacture

*Administration*: method of drug delivery to the body

*Toxicity*: radical side effects on the body from the drug

1. Mark on the crystals where inhibitor molecules would bind to cause the crystal to have the observed shape or morphology.

|  |  |
| --- | --- |
| **Original** | **Mark on each crystal where inhibitors bind** |
|  | C:\Users\Megan\Desktop\Research\updatedGRAD\Notebook 1\Figures\morphology.tif |

For the second crystal with blue inhibitor molecules, another acceptable answer is to have the molecules bind the opposite face (the side where the arrow points down); in this case, it will be one or the other, but not both sides. The third crystal is for both faces.