Name:

Date:

School:

Facilitator:

2.05 Physiology of the Skin Color

**“What is Melanin?” (3rd Stop Point)**

**Go to the HHMI Bio-Interactive video, “How We Get Our Skin Color” (**<http://media.hhmi.org/biointeractive/interactivevideo/skinidoc/?_ga=1.229552468.937441478.1483677719>**) and stop at the 3rd stop point, indicated by the white bar, choose “more info,” and answer the following questions about how melanin is made inside melanocytes and one of the genes that controls skin color.**

1) What is Melanin?

2) Melanin is a       that is produced in organelles called       in specialized cells called      .

3) What are the two primary **types of melanin and how do they differ**?

 a. (Melanin Type)

b. (Melanin Type)

4) Explain how the amount of eumelanin and number of melanosomes differ between a person with lighter color skin and a person with darker color skin.

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5) Which type of melanin is produced by the version of the MC1R gene (i.e., the MC1R allele) most prevalent among people of African ancestry?

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6) What can be inferred from the fact that there is little diversity in the form of MC1R gene found among individuals from equatorial Africa?

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# “How Does Melanin Protect Cells?” (4th Stop Point)

**Continue with the HHMI Bio-Interactive video, “How We Get Our Skin Color” (**<http://media.hhmi.org/biointeractive/interactivevideo/skinidoc/?_ga=1.229552468.937441478.1483677719>**) and stop at the 4th stop point, indicated by the white bar, choose “more info,” and answer the following questions about how melanin protects DNA from UV damage and how mutations in DNA lead to cancer.**

7) Name two molecules in the body that UV radiation can damage.

a.

b.

**8) What are pyrimidine dimers, what causes them, and why are they dangerous?**

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 **9) How can pyrimidine dimers lead to cancer?**

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**“How Does Sunlight Cause Tanning?” (5th Stop Point)**

**10) UV radiation has**       **wavelengths and** higher **energy than visible light and infrared radiation.**

**11) What are the positive and negative effects of UVB exposure?**

 **a. Positive –**

 **b. Negative –**

**12) Explain how the relationship between skin color and UV radiation provides evidence that this trait evolved by natural selection.**

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**13) What is the selective pressure for darker skin color? For lighter skin color?**

**a. Darker skin –**

 **b. Lighter skin –**

 **14) Explain the difference between constitutive and facultative skin color.**

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 **15) What causes skin to tan? What causes skin to sunburn?**

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 **16) Your friend, who tans easily, argues that it’s great to get a tan because darker skin pigmentation offers lots more protection from damaging UV radiation, so he’s keeping himself safe. Would you agree? Explain.**

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