Deliberative Democracy: Endocrine Disrupting Chemicals (EDCs)

Alignment with Course Content

This module can be used to reinforce material related to the endocrine system, such as chemical messengers, feedback loops, and binding sites.

Necessary Background Knowledge

- The endocrine system
- Hormones and hormone actions
- Signaling mechanisms and feedback loops

Policy Issue

The endocrine system is vital to maintaining homeostasis. There are chemicals that can potentially disrupt this system (endocrine disrupting chemicals, EDCs). Potential endocrine-disrupting chemicals (EDCs) are components of many products commercially available in stores. Such products may include: soaps, creams, sunscreen, makeup, deodorants, plastics, and powders. The following chemicals have been cited as having potential endocrine disrupting effects: triclosan, parabens, phthalates, EDTA, BPA, talcum, and oxybenzone.

DD Module Question: *Should there be regulation on cosmetics that contain endocrine-disrupting chemicals (EDCs)?*

Module Goals

Students should be able to:

- Search and utilize published scientific data to construct an argument
- Discern between credible and less-credible resources available on the internet
- Describe the various ways that endocrine signaling works
- Describe what could happen when EDCs are introduced to the body
- Address a problem with consideration of multiple variables - including scientific, social, and economic factors

Deliberation Scaffolding

Students should consider:

- What is known about EDCs?
- Who is most at risk of being impacted by EDCs?
- What about EDCs are potentially concerning?
- What problems could EDCs cause in the body?
- Where do EDCs act in the body?
- Why are EDCs used in products?
- Are there any current restrictions on EDCs in products?
- Are there any socioeconomic factors to consider about these products?

Instructor Notes

Implementation Suggestions

- Implement this module after students have learned the basics about the endocrine system, types of hormone signals, and mechanisms of signaling. It may be helpful to introduce an example with robust evidence of the impacts of EDCs such as the herbicide Atrazine's impacts on amphibian populations.
- Consider showing the first part or the whole video of "Our Chemical Lives" (https://www.youtube.com/watch?v=J9SWBAUlAvw&feature=youtu.be)

Articles

Media:

NYT Opinion 2018-What Poisons Are in Your Body?

Peer reviewed:

Environmental Pollution 2015-Reproductive endocrine-disrupting effects of triclosan: Population exposure, present evidence and potential mechanisms

DOI: 10.1016/j.envpol.2015.07.001

Informative Articles Students Might Find

WHO-Endocrine Disrupting Chemicals (EDCs)

Peer Review-Endocrine-Disrupting Chemicals: An Endocrine Society Scientific Statement

Hormone.org-Endocrine-Disrupting Chemicals (EDCs)

Endocrine Society-Endocrine-Disrupting Chemicals

Environmental Working Group-Dirty Dozen Endocrine Disruptors

Peer Review-What is an endocrine disruptor?

Media Paper (Multiple-Choice Assignment Ideas)

NYT Opinion 2018-What Poisons Are in Your Body?

What Poisons Are in Your Body? by Nicholas Kristof, New York Times

Example question topics:

- Definition of EDCs
- Chemicals that are considered EDCs
- Ways to limit exposure to EDCs
- Sources of EDCs
- Effects of high exposure to EDCs
- Regulation of EDCs

Peer Reviewed Paper (Multiple-Choice Assignment Ideas)

Environmental Pollution 2015-Reproductive endocrine-disrupting effects of triclosan: Population exposure, present evidence and potential mechanisms

DOI: 10.1016/j.envpol.2015.07.001

Reproductive endocrine-disrupting effects of triclosan: Population exposure, present evidence and potential mechanisms by Cai-Feng Wang and Ying Tian

Example question topics:

- Why is there interest in tricolsan?
- Sources of triclosan exposure
- Which body fluids are utilized to test for triclosan? Why?
- Mechanisms of endocrine disruption
- The type of study utilized in the paper

Deliberative Democracy: Endocrine Disrupting Chemicals

Leader **First & Last Name**		Facilitator/Spokesperson **First & Last Name**	
Recorder **First & Last Name**		Devil's Advocate/Summarizer **First & Last Name**	

Group's EDC: _____

Question to scientists: Should there be regulations on cosmetics that contain this EDC? If no, please defend your stance. If so, what regulations would you recommend and why?

What do you need to know before you can make an informed recommendation?	Why does this missing piece of information matter? (include social and science rationales)	Who will find 2-3 articles about this concept (at least one per box must be peer-reviewed)?
A.		**1.** **2.** **3.**
B.		**1.** **2.** **3.**

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What do you need to know before you can make an informed recommendation?	Why does this missing piece of information matter? (include social and science rationales)	Who will find 2-3 articles about this concept (at least one per box must be peer-reviewed)?
C.		**1.** **2.** **3.**
D.		**1.** **2.** **3.**

Before doing background research, what is your group's initial stance?

End of Day 1. Consult your textbook and find at least 2 peer-reviewed articles per question for next week.

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Group's EDC: _____

Question to scientists: Should there be regulations on cosmetics that contain EDCs? If no, please defend your stance. If so, what regulations would you recommend and why?

Evidence to support your science advisory statement:	Source title and journal (or media outlet) AND initials of who found the article	Which lecture topics or textbook chapters cover this material?
A.		
B.		

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D.		

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Science Advisory Statement **(Deliberate to a consensus):**

End of Day 2. Thank you for investing your time and energy on this activity!