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VOIR DIRE

Goal: lay foundation for use of docs

FAMILIAR WITH VARIOUS DOCUMENTS

- As part of your role as a forensic scientist with Bode Technology, you stayed up to date with current literature related to forensic DNA analysis
- And you continue to do that now?
- As part of your education and training, you have studied and become familiar with various studies, texts and other material relating to forensic DNA typing?
- There are some fundamental or foundational texts in the field of DNA forensic testing, yes?
- Texts that are considered authoritative in the field of DNA forensic testing?
- One set of these authoritative or foundational texts in the field are the books by John Butler?
- One of these is *Forensic DNA Typing and Advanced Topics in Forensic DNA Typing: Methodology*
- And you are familiar with the Butler texts?
 - [yes, I don't know them word for word]
- But those are texts that you were trained on?
- That are considered foundational?
- And authoritative?
- You're also familiar with peer reviewed articles on forensic DNA typing?
- Specifically familiar with [articles on ease of transfer]

CELLS HAVE THE SAME AMOUNT OF DNA

- Let's go back to the basics for just a second.
- DNA is found in almost every cell of the human body?
- Found in the nucleus of the cell?
- Yolk part?
- Besides sperm and eggs, individual cells themselves, contain the same amount of DNA
- About 6 pico grams (10^{-12}) of DNA per cell
 - [don't remember]
 - Remember the butler book we were discussing as authoritative in the field?
 - Says 6.6 pg in a cell
- Pico gram 1000 times smaller than nanogram

Sugar packet demo?

DNA KIT ONLY NEEDS A LITTLE DNA

- The DNA kit used to do this typing is designed to work with very little DNA
- The DNA kit used to do this typing is designed to work with .5-1 ng of DNA
 - [Not necessarily; low amt of DNA, I'd want more]
- Well, Bode considers as little as .5ng ideal?
- 1 optimal?
 - Bode puts out protocols
 - Procedures analysts must follow?
 - You followed these protocols?
 - Required to follow protocols?
 - Show what I've marked as D Exhibit 7
 - Bode's amplification protocol
 - Tells you steps required to follow in amp process?
 - Including how much dna to put in to the amplification?
 - .5-2ng ideal, 1ng optimal
- < 100 cells enough
 - $100 \text{ cells} * 6.6\text{pg} = .66\text{ng?}$
 - Right in that range of .5-1ng
- Enough to do a DNA test

DNA GETS EVERYWHERE

- DNA is, well, small?
 - It fits not only inside a human cell, but inside the nucleus of that cell?
- And DNA also transfers easily?
 - Meaning, any time you touch something, you can leave DNA behind?

Cell example

- For instance, you touching your cell phone – you might leave DNA on your cell phone just by touching it?
- You could, for instance, swab this cell phone find DNA on what you collected on a swab
- Swab is just a q tip – stick with cotton at the end?
- And you might have left [more than] a few hundred cells by touching that cell phone podium/pen/whatever right now?
- And if I came up to you and I borrowed your cell phone for just a sec, I might even get the DNA you left on your phone on my hand?

Shed on sheets example

- So let's explore that a little more
- In fact people shed hundreds of cells every day by not really doing anything at all?
- I might be shedding right now?
- Shed when I'm sleeping into my bed?
- Shed onto my sheets
- And just for hypothetical purposes, if I was the type of sleeper who sweat a lot – not saying I am – I might even shed more cells?
- Because more cells are shedding as I sweat

- And if before I went to sleep, I had been touching my eyes or my mouth or my nose, I might leave DNA from those places onto my sheets?
- And let's say I drooled in my sleep – not saying I do – I might leave even more DNA in my sheets because of that drool
- Or if I blew my nose in my sleep right onto my sheets, might leave a whole lot of DNA
- And if I'm the type of person who didn't change my sheets for oh, let's say several weeks, those cells of DNA would be collecting day after day, week after week?

Party hypo

- So let's say I invite you over to my house and I say go ahead and leave your stuff on my bed
- You toss your jacket and your phone right there into the sheets
- Its possible that the cells collecting for weeks in my bed from my skin, from my sweat, from my drool, from my snot, from all of that, might get on your phone?
- And you might swab your phone?
- Test it for DNA
- And get my DNA on it?

DK WHAT TYPE OF CELLS DNA IS FROM

- When you test that swab, and get DNA results consistent with my DNA, you can't say what type of cells the DNA came from?
 - Whether cells were from skin I shed or saliva I drooled or, whatever cells are in my snot? All epithelial cells

DNA TESTING ONLY TELLS YOU THAT THERE IS DNA NOTHING MORE

- That example—the cell phone at my party thing we just went through—that’s an example that demonstrates that just because you find DNA on a swab from some surface, you can’t say how the DNA got there?