Biological evidence essay

Science, Genetics

When analyzing a scene or an point of grounds it is really of import to be cognizant of any biological grounds.

This is because biological grounds is forensically really of import because it can do a direct nexus between a suspect and the scene or point utilizing DNA profiling. One of the most utile pieces of biological groundss is blood. It is possible to easy pull out DNA from a blood sample which will bring forth a DNA profile which can be a direct nexus to the individual it belongs to. First, the sample has to be identified as perchance being blood utilizing a presumptive trial. Presently there are many different types but a common one is the Kastle-Meyer trial.

This reacts with hemoglobin ensuing in a coloring material alteration and can observe blood diluted down by 1 in 1×104 (Johnston et al, 2008) . This technique besides has the advantage that it does non degrade any DNA leting DNA analysis to take topographic point afterwards (Bittencourt et al, 2009) Newer techniques are being produced utilizing anti-primate antibodies which merely react with archpriest hemoglobin. These techniques, such as Hexagon OBTI, have the advantage that blood from other species, such as a domestic pet, will non give a positive consequence salvaging clip and money. (Johnston et al, 2008)After a positive presumptive trial has been established so it needs to hold a collateral trial to turn out it is rebelliously blood. This can be done with either a Takayama or Teichmans trial. These trials react with the hemoglobin to bring forth crystals which can be identified under a light microscope (Virkler & A ; Lednev, 2009a) . A possible new confirmatory technique for blood is by utilizing Raman spectrometry. This is a utile technique because it can be used on really little

samples and does non destruct any of the sample (Wael et al, 2008) (Virkler & A ; Lednev, 2008) .

If you merely have a little sample of blood so you might non be able to afford to destruct any of it you can utilize this method to corroborate that it is blood. Semen is another organic structure fluid frequently found at a offense scene. Current methods for sensing of blood include the presumptive Acid Phosphate trial. This reacts with the acid phosphate in the seeds ensuing in a color alteration. However, other stuffs contain acerb phosphate such as virginal secernment which will give false positives. (Virkler & A ; Lednev, 2009a) . To corroborate the presence of seeds, either microscopy or a Prostate Specific Antigen (PSA) trial in carried out.

In microscopy the sample is stained and viewed under a microscope for any sperm cell. However, this will non work in males who do non bring forth Spermatozoa. (Virkler & A ; Lednev, 2009a) . Another method is utilizing a PSA trial. This is an check which reacts with PSA, which is merely in sufficient measures in seeds (Pang & A ; Cheung, 2007) . A more recent trial has been developed which looks for semenogelin utilizing a RSID-Semen Trial. This has an advantage over PSA because it is possible that semenogelin is more stable. (Pang & A ; Cheung, 2007)Like blood, Raman spectrometry could perchance be used as a collateral trial for seeds.

Virkler & A ; Lednev (2009b) have shown that it is possible to utilize Raman spectrometry to confirmatory trial for seeds. The advantages of this method are similar to blood in that it is non-destructive to the sample. Besides, portable Raman spectrometers are readily available which means this

technique can be easy carried out at a offense scene salvaging negative samples being brought back to the research lab. The trials mentioned above are all carried out one at a clip. This can blow clip, sample and money if you have to transport out each 1. Besides, one time the presence of blood or seeds has been confirmed it is sent off for DNA analysis. However, due to the cost in both clip and sample, sometimes the collateral measure is missed out and the sample is sent directly off for DNA analysis. (Hansen et al, 2009) This means that samples that do non incorporate biological discolorations are being analysed for DNA which is expensive.

Juusola & A ; Ballantyne (2005) have developed a method for placing and corroborating a organic structure fluid from the messenger RNA nowadays. Each different type of cell expresses different cistrons and hence has different measures of messenger RNA species present in them. By placing the messenger RNA nowadays through PCR it is possible to place the biological discoloration. This has the advantage that you can prove for more each sample (blood, piss, seeds etc.) at the same clip salvaging both clip and sample. It besides will observe virginal secernments (Juusola & A ; Ballantyne, 2005) .

Another advantage is that it will observe seeds from work forces who do non bring forth sperm every bit good as work forces who do bring forth sperm in one trial. (Hass et al, 2009) However for the technique to work you need to hold integral mRNA in the sample. It is possible to pull out messenger RNA from stains up to 15 old ages old (Hass et al, 2008) nevertheless it has been shown that rain has an consequence on the sum of mRNA present and

can the clip of recovery dramatically. For illustration, adequate messenger RNA can merely be collected within three yearss from blood exposed to rain alternatively of 30 yearss (Setzer et al, 2008) . Hansen et Al (2009) has shown that it is possible to place the biological sample utilizing microRNA (miRNA) . miRNA ' s are merely 20-25 base braces long and are hence less likely to be degraded through the environment and clip.

By utilizing messenger RNA and miRNA, a forensic scientist can be a batch more efficient as he can confirmatory prove each discoloration for all organic structure unstable types utilizing merely one trial significance they can pass less clip on each point. Besides less of the sample will be wasted, leting more to be available for DNA testing.

Mentions

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