Urine Therapy Research Initiative – Report – Sept 2024

SYNOPSIS

September has been a full month. The work of the last 5 months is coalescing now and has momentum. The next possibilities include: moving forward with more researchers, establishing contacts, and support networks. Over the past months most of the work has been in research and reading. After a deep dive into academic papers and scientific research an overview of the field is starting to emerge. This provides the foundation on which to start conversations with other researchers. Planning with the team for the next six months would be good so that we can work together towards a common goal for the research. Below are the main areas of focus that have been developed since April.

- **Heavy Metals** - The body of work on Heavy Metals has grown and the research has yielded great possibilities for overlap with urine therapy. There are now various avenues worth researching out to academics in order to confirm research hypotheses.
- **Urine Stem Cells** – Our contact in stem cell research is on board to start the preliminary tests towards a full research project. [We have not investigated **VSELs** in more depth yet. Very-Small-Embryonic-Like stem cells are a sub-set of urine stem cells research. Jonathan has a contact in this area.]
- **Research Spreadsheet** – The link to an uploaded version of the research spreadsheet, which also functions as a bibliography organized by topic, was sent to Ed and Jonathan at the end of September. This is an evergreen document with links sorted by theme/topic to documents, articles, and videos on the breadth of urine research undertaken to date by the Research Initiative.
- **Discussion Paper** – Ongoing writing and development of an academic paper which can be used as a draft for discussion papers. This can then be repurposed to inform and engage researchers in various fields on urine research. I've included the first pages of this document at the end of this document.
- **Reviewing UT literature and materials** – The past months have included reading and listening to Jonathan and Ed's interviews as part of Health Secrets, other videos and documents. As well as reviewing books on UT from Martha Christy and others.
- **Contacting UT Advocates:** *Amanda Vollmer*, Dr. Naturopathic Medicine. Based in Canada. She is experienced with DMSO. And is writing a book on Urine Therapy. Conducted an interview with her. Also, have been invited to an interview with *Fiona Gardner*, a microscopist based in the US, who conducts research on the crystalline forms found in the urine.

<u>Contacting Researchers:</u>

Five researchers have been sent emails requesting a conversation/correspondence about their research. Depending on their responses, I'll proceed to contact other researchers.

<u>Human Derived Urine Stem Cells:</u>

Our contact, Dr. C, has read the Wake Forest study from 2022. She sees the relevance of doing a follow up study. Specifically doing one without isolating the stem cells from the whole urine. Wake Forest isolated the stem cells and used a medium to hold them. She posits that leaving

them in the urine will give us more information as to what the power of these stem cells could be for clinical and personal application. As we are interested in developing a protocol that can be used by anyone in the world and be free, easy and repeatable, this would be the first step in examining urine as a whole product.

In a discussion with Dr C, on September 27 the following steps were suggested:
Preliminary test with Mass Spectrometer

- This would require samples from one person.
- Ideally 10-15ml each of fresh, aged unfiltered and aged filtered.
- This test would be to determine what can be detected and used for further investigation.
- A possible participant has been identified in the geographical area who has been working with UT for 2 years and has aged urine.

Further steps to continue this research will be based on writing a study proposal, going before the ethics board to ensure the risks for clinical trial participants are managed, and finding participants.

Current Research Focus of the Initiative – Draft Position Paper:

- Continuing to follow the threads of correlating heavy metals to specific endogenous enzymes and proteins.
- Integrating the articles that have been surveyed for quotes and footnotes in the draft position paper on urine research.

NEXT STEPS:

- October – produce a draft document (see current draft below) that can be used as needed to engage future research and partners.
- Continue the discussion with Dr. C on analysing fresh and evolved urine.
- Beginning discussions with researchers in related fields to find possible partners.
- Continue all previous aspects of the research project as enumerated in previous reports.

Prepared by Megan Macdonald

DRAFT DISCUSSION PAPER - Urine and Heavy Metal Detox

This discussion paper is part of a larger research project – The Uropathy Research Initiative – that has a few aims – to propose that human urine has healing properties that include the benefits of stem cells, and to propose that urine has a positive effect on detoxication and detoxification pathways of many toxins, but specifically heavy metals.

Uropathy Research Initiative

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This paper is part of the Uropathy Research Initiative which has two specific research aims – human derived urine stem cells, and the detoxification potential of urine in relation to toxins and heavy metals. The overarching research initiative also has an education component as urine is not yet known for its far-reaching health benefits. This paper is one part of redressing this lack of education. The current paper's focus is on heavy metals/toxins and detoxification potentials with urine.

Background and justification

Urine Therapy or Uropathy practices have been around for thousands of years:

> "Analysis of urine for medical purposes dates back more than 3,000 years. In fact, up until the late 1800s, urine analysis using colour, taste and smell (called uroscopy) was one of the primary methods early physicians used to diagnose disease. Even today, millions of chemically based urine tests are performed every day to identify newborn metabolic disorders, diagnose diabetes, monitor kidney function, confirm bladder infections and detect illicit drug use."[1]

One of the oldest known documents on urine as medicine is the Damar Tantra, a roughly 5000-year-old document from India. It details many external and internal practices that can bring overall health and well-being. Other cultures around the world have long histories of using one's own urine and occasionally that of others, in specific circumstances.

With the advent of allopathic medicine urine has consistently been one of the most researched topics in science. Urine is generally gathered and then chemicals, or elements are isolated and studied. What has rarely been undertaken is the study of a group of people's urine where the urine is linked to the individual throughout the testing process. Also missing from research is a study of the use of whole urine and those who use it in various consistent applications, e.g. drinking a daily amount. However, this does not mean that there are no academic or clinical studies available for reference.

History of Urine Research

Hundreds of research papers have been published on various chemical elements found in urine. The University of Alberta in Canada has been undertaking metabolome research since the mid 2000s and includes a focus on urine metabolites. The traceable metabolites currently number over 3000 endogenous and over 3000 exogenous elements. Among the elements in urine some of the most researched include urea, uric acid, hormones (specifically female and male

[1] https://www.ualberta.ca/en/medicine/news/2013/september/urinechemicals.html

hormones), enzymes, proteins, peptides and minerals. Research into urine has led to the creation of many treatments and pharmaceuticals including urokinase (which is a low molecular weight form of human urokinase used to treat pulmonary embolism and myocardial infarction). Researchers at Wake Forest University have been working on urine derived stem cells since 2008 with multiple grants since 2019. They have published widely since 2019 on the capacity and possible applications for human derived urine stem cells. Urine is being taken more seriously and is breaking away from its label of waste-product.

Auto-Urine Therapy and removing the term 'waste'

Auto-Urine Therapy is known by many names around the world including uropathy, Ameroli, and Shivambhu. People who use various internal and external urine protocols report healing from physical, and mental/emotional issues. There are no studies of people who consume their own urine. However, personal stories of health success form the basis of all medical inquiry. Patients tell their doctors what is working and through curiosity and replication doctors follow leads that result in new practices, protocols and treatments.

Urine is often referred to as waste. Yet those who have studied it more closely come to adopt the term 'excess' in reference to what the body chooses to put in urine. As an example, urine is 95% water which is filtered by the kidneys and removed throughout the day, not because the water is waste or toxic, but because it is in excess of what is needed to maintain ideal blood viscosity. Similarly, Vitamin C is filtered out of the blood when there is an excess. Clearly, this vitamin C is not a waste product. With what we now know about the daily production of new stem cells that are put into urine every day, is it not time to rethink the role of urine? The body is producing viable, useful new stem cells every day and putting them in urine. This points to urine being a potent and constantly updated biofluid capable of supporting the body's needs. Could we not extrapolate that the body sees urine as a useful, possible avenue for furthering human health?

Heavy Metal Detoxification

In this paper we are reviewing some of the literature that exists on toxins and heavy metals, and avenues for detoxification[2]. Research from different areas of scientific inquiry sit side by side in relation to urine research to make the case that urine has the potential to help the body relieve the stress put on all systems by heavy metal loads. This is particularly interesting because, as explained in Ohiagu et al.: "Every heavy metal has its own specific unique mechanistic process

[2] Counteract the activity or effect of a substance, make ineffective or neutral. "Detoxify." *Merriam-Webster.com Dictionary*, Merriam-Webster, https://www.merriam-webster.com/dictionary/detoxify. Accessed 1 Oct. 2024.

through which it exhibits toxicity."[3] This paper makes the case for the specificity of human urine to detoxify the individual. Research on heavy metals is clear that the interactions of heavy metals are specific and unique. Even will all the avenues for chelation and removal, cases exist of individuals where multiple options were tried before the successful removal of heavy metals from the body.

The specificity of heavy metal (HM) detox could therefore be said to be multilayered. This is also reflected in the literature that has been published on the topic. The approaches for detox range from high level academic research to herbalism. Scientific papers abound on probiotics, chelation chemicals/processes, etc. In the world of functional medicine, herbalism, naturopathic approaches, and holistic health overarchingly, the approaches are more focused on supplements, food, saunas, and other lifestyle changes.

Both allopathic and holistic medicine use biospecimen testing to determine HM loads. All agree that HM detoxication and detoxification takes time. HMs reside in various tissues across the body. The more complex the tissue, the more time it takes to remove.[4]

Detoxification Pathways

How the body removes toxins and chemicals is important and much investigated. Known and often studied biospecimens include blood, hair, urine, sweat, feces, saliva, breast milk, cerebrospinal fluid, bile, and amniotic fluid. As well, toxins and HMs build up in various organs, liver and kidney being high on the list.

Researchers in the field of HMs acknowledge that, "there is limited understanding of the toxicokinetics[5] of bioaccumulated toxic elements and their methods of excretion from the human body."[6] In other words, the ways in which the body absorbs and eliminates toxins, including HMs, is not well understood. Academic articles on HMs were rarely published until the 1960s, and over half of papers published have been written since 2010. Interest and information about toxins and HMs has grown hugely in recent years as testing abilities have also become more sophisticated with mass spectrometry and other methods.

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[3] Ohiagu FO, Chikezie PC, Ahaneku CC, et al. 'Human exposure to heavy metals: toxicity mechanisms and health implications.' *Material Sci & Eng.* 2022; 6(2):78–87. DOI: 10.15406/mseij.2022.06.00183. 78

[4] In Ayurveda the complexity of tissues is listed in the following order: plasma, blood, muscle, fat, bone, marrow/nerve, and reproductive tissue. And repairing or strengthening each of these takes more time at each level of complexity.

[5] "Toxicokinetics is a subfield of toxicology, which studies how, how fast, and to what extent toxicants are absorbed by, distributed in, metabolized by, and eliminated from the bodies of living organisms." *ScienceDirect* https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/toxicokinetics [accessed 1 Oct 2024]

[6] Genuis, Stephen J. et al. *Blood, Urine, and Sweat (BUS) Study: Monitoring and Elimination of Bioaccumulated Toxic Elements*. Arch Environ Contam Toxicol (2011) 61:344–357, 344. DOI 10.1007/s00244-010-9611-5

With more research comes the sense that there is a shared common knowledge about how toxins work in the body. Detox is a buzzword in almost all health communities with guided detoxes focussing on supplements, exercise, diet, and more. While many studies provide details that help both scientists and the clinical medical field to grow their understanding of HMs, there continue to be studies that challenge held assumptions. As explained by Stephen J Genius et al.:

> "Biomonitoring based exclusively on measurements from blood and/or urine can provide misleading conclusions about the state of toxicant accrual and can underestimate the total body burden of xenobiotics."[7]

What Genuis is referencing is how in their study on HMs (Arsenic, Aluminium, Bismuth, Cadmium, Cobalt, Chromium, Copper, Mercury, Manganese, Molybdenum, Nickel, Lead, Antimony, Selenium, Tin, Thallium, Uranium, and Zinc) in BUS (Blood, Urine and Sweat) revealed limitations, as "serum levels of various xenobiotics do not necessarily reflect the total body burden of such compounds because accrued toxicants may store in tissues, and serum levels may belie actual toxicant status."[8] Testing was not fully reliable in the way that science would like as bodies store toxins in tissues that are hard to monitor, and blood values can change even throughout the day.

In a study on Polybrominated Diphenyl Ethers (PBDEs) or Flame Retardants, tests were carried out to determine what accumulations were detectable in BUS. While PBDEs are known to be in the body and carcinogenic, researchers were surprised to find they were not traceable in urine, even when detected in other biospecimens:

> "Induced perspiration facilitated excretion of the five congeners, with different rates of excretion for different congeners. Conclusion. Blood testing provides only a partial understanding of human PBDE bioaccumulation; testing of both blood and perspiration provides a better understanding."[9]

From this we could assume that testing multiple biospecimens will give a comprehensive picture. However, various studies once again demonstrate that even testing across specimens does not guarantee that the results will correlate, e.g. the following example between sweat

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[7] Genuis, Stephen J.et al. *Blood, Urine, and Sweat (BUS) Study: Monitoring and Elimination of Bioaccumulated Toxic Elements*. Arch Environ Contam Toxicol (2011) 61:344–357, 355. DOI 10.1007/s00244-010-9611-5
[8] Genuis, Stephen J.et al. *Blood, Urine, and Sweat (BUS) Study: Monitoring and Elimination of Bioaccumulated Toxic Elements*. Arch Environ Contam Toxicol (2011) 61:344–357, 353. DOI 10.1007/s00244-010-9611-5
[9] Genius, Shelagh K. et al. p. 5. *Human Excretion of Polybrominated Diphenyl Ether Flame Retardants: Blood, Urine, and Sweat Study*. BioMed Research International (2017) 1-14, 1. DOI 10.1155/2017/3676089

and blood plasma that explains, "it is evident from the results that sweat does not represent an ultrafiltrate of blood plasma because concentrations of various elements vary considerably between serum and sweat."[10]

In a study on mercury (Hg) in children in China, once again the results of blood, hair and urine did not line up as expected:

> "Our results for blood and hair Hg levels exhibited a strong correlation ($r = 0.49$, $p < 0.0001$); and although Hg levels determined by analysis of urine and hair showed a significant positive correlation ($r = 0.20$, $p = 0.0008$), the Hg levels in blood did not correlate significantly with Hg levels in urine ($r = 0.07$, $p = 0.35$)."[11]

The researchers further explain in more detail, that given their findings, urine was the overarching method of choice to examine Hg. A key differentiation was that urine was a "better indicator for exposure to inorganic Hg" and, "analysis of hair is preferred for estimating the body's burden of organic Hg compounds."[12] Each study consistently reinforces the complexity of HMs and detoxification.

All of these examples are provided to show that while the base of knowledge on toxins in the body is widely researched, the potential exists for unexpected correlations. Ultimately the way that each human body responds to toxins is individual and highly specific. This paper posits that the potential for healing, releasing toxins and repairing the physical body has both universal and highly individual aspects.

It is in this vein that urine becomes an example worthy of examination as it is both a universal substance, as every human produces it daily, and a highly specific biofluid tailored to the

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[10] Genuis, Stephen J. et al. *Blood, Urine, and Sweat (BUS) Study: Monitoring and Elimination of Bioaccumulated Toxic Elements*. Arch Environ Contam Toxicol (2011) 61:344–357, 353. DOI 10.1007/s00244-010-9611-5

[11] Chen, Guixia et al. *Surveying Mercury Levels in Hair, Blood and Urine of under 7-Year Old Children from a Coastal City in China*, Int. J. Environ. Res. Public Health (*2014),* 11, 12029-12041, 12038. DOI:10.3390/ijerph111112029

[12] "In light of our findings, it is important to point out that currently the method of choice for evaluating an extended period of exposure to Hg is urinalysis. Our correlation analysis of blood and urine Hg levels showed that blood and urine Hg levels were not significantly related ($r = 0.07$, $p = 0.35$), while urine and hair correlation analysis yielded an r and p value of 0.20 and 0.0008, respectively. This result was in agreement with the study by Pesch et al. [25] that concluded hair and urine Hg levels correlated poorly ($r = 0.297$), and suggested analysis of hair cannot be considered an alternative method to the analysis of urine. Nevertheless, both methods contribute to a comprehensive estimation of the total Hg exposure; and our study did not analyze whether the Hg detected was organic or inorganic, analysis of urine is a better indicator for exposure to inorganic Hg, whereas analysis of hair is preferred for estimating the body's burden of organic Hg compounds." Chen, Guixia et al. *Surveying Mercury Levels in Hair, Blood and Urine of under 7-Year Old Children from a Coastal City in China*, Int. J. Environ. Res. Public Health (*2014),* 11, 12029-12041, 12037. DOI:10.3390/ijerph111112029

individual. Beyond the obvious, that each person's urine is unique, it could actually be claimed that it is as unique as a fingerprint. As the director of the Human Metabolome Study at the University of Alberta, Dr. Wishart, explains:

> "You can potentially identify a person from their urine. […] Your urine composition stays with you pretty much your whole life. It will change slightly depending on what you eat or drink, but it will still have the same underlying chemical composition that is unique to you."[13]

[The paper can continue in a variety of directions depending on the focus that would be of most use to the Research Initiative at this time.]

[13] Spitznagel, Eric. *Pee Is So Much Crazier Than We Ever Realized*. Vice.com. February 28, 2017. https://www.vice.com/en/article/pee-is-so-much-crazier-than-we-ever-realized/ Accessed 26 June 2024.