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The Pursuit of Understanding:

- Seeking to grasp and employ differing medical systems for the same end.
- 



Background: Before Leaving

- UW Madison Research:
 - Post Traumatic Epilepsy (increased Incidence)
 - Reoccur with no underlying cause
 - The development of Epilepsy following a traumatic brain injury (ie a car crash, military, sports. etc.
- Slow vs Fast kindling Rat Models Kindling = epilepsy induction
- 10 year breeding only at UW Madison (evoked with TBI to develop spontaneous)
- Seizure induced brain plasticity
 - Normal outbred
 - plasticity susceptible
 - plasticity resistant



How I got Interested in Natural Medicine

- Ethnobotany class:
 - How different cultures use nature around them to survive and increase their quality of life. Ag, Food, Clothing, Housing, Art.
- Medicine!



Desired a deeper understanding of Natural Medicine in Neurodegenerative diseases.

- Why we are not using these time tested treatments and ancient knowledge
 - Drug development
 - Mechanism of Action
 - Diagnosis
- Paralleled traditional medicine in multiple cultures
- How can I implement natural medicine or alternative treatment in my studies of Epilepsy
 - Term paper on natural treatments to Epilepsy
 - Applies to all neurodegenerative diseases?



Underlying Mechanisms of all neurodegeneration?

- How Does Ayurveda deal with these related diseases?

- Epilepsy increases the rate of cog decline in AD
- .5 seizures in AD are non-convulsive (subclinical)
- In a clinical study 35/45 AD patients also had epilepsy and other 7 had epileptic activity
- AD + Epilepsy = cog decline 5.5 years earlier than just Epilepsy
- 10-22% of AD patients develop epilepsy
 - (Vossel et al 2013)
- AD = high risk of developing epileptic seizures
 - Epileptic hyperexcitation -> hypertoxicity hypothesis?
 - (Epileptic seizure in AD: A review, Horvath, szues)



Natural Medicine: Merging with modern science and finding exceptional results

- In a search for medicinal plants to combat HIV, 50 plants from native shaman knowledge and 16,886 randomly sampled plants were tested for efficacy. Proving to be 30% and 8.5% effective respectively (Minnis and Elisens, 2000)
- Seeking plants, high in molecules that are used in drug treatment Aged garlic extract rich in S-allyl-cysteine (SAC) and di-allyl-disulfide (DADS) (current synthetic drugs) ameliorative efficacy: aged garlic extract > SAC > DADS (Chauhan, 2006)



Traditional knowledge can lead us to a mechanism of action hypothesis.

- Cholinergic hypothesis (Not new)
- Chinese: Huperzine (cholinesterase inhibitor)
- China/Renaissance Europe/ India: Sage (cholinesterase inhibitor)
- China: snowdrop and daffodil (cholinesterase inhibition, nicotinic channel activators)
- Ayurvedic: Bacopa monnieri (mitigate reduction of cholinergic neuron densities)
 - (Perry et al 1999) (Uabundit et al 2010)



Mechanisms are not well understood in either disease. Treatments are sub par and progressing slowly

Why?

In Western medicine, the focus is on treating a disease, a mechanism, a process, if we cant understand a disease it is hard to create a treatment.

What the disease is and how it works??

How to restore normalcy??

? -----> ?

Deriving the mechanism by which the disease disrupts normal functioning (targets)

Thus a new medicinal model is needed....

Ayurveda

Medical science based on observation before the age of technology.

Thus it is a wealth of knowledge focused on treating the whole person based on observations of input and output.


Attempts to treat an entire person deviating from normal, rather than the specific disease.

Limitations- Fails to address the modern biological process by which output is observed

Person suffering
from
destabilization
of biological
processes



Person with
more
stabilization of
biological
processes



Thus we need to implement both medical systems to come to a greater understanding of disease and the human being.

Each seeks to understand via different worldviews to the same end.

TDU

Understands the importance and truth behind Ayurvedic practices

Understand the truth and implications behind modern technology

- The ability to use both medicinal systems in conjunction with each other, filling in each others short comings in an attempt to understand the whole truth.
 - Drug Development
 - Mechanism of Disease



C elegans (CL4176, CL2006)

- AB accumulation in muscle over their lifespan
- Brahmi treatment (*Bacopa monnieri*)

- Hope to learn?
 - Mech of Action (AB)
 - How human AB aggregates in the brain
 - Production or repression of AB Different phases of their life
 - Different phases of accumulation
 - Production of oligomers vs aggregates
 - Toxicity of aggregates
 - Why/How
 - Toxicity of Oligomers
 - Mech of Action (Brahmi)

Results:

- Paralysis
- Staining (aggregates)
- Western (oligomers + aggregates)

TDU



Building



Lab



Day In the life

- 6-7 Days a Week, 10 Hour Days





My project

Worms

- CL 4176
- Plasmid
 - Human AB protein
 - Rolling phenotype
 - Temperature dependent

Must "pick" the worms with the roller phenotype because you know that they also possess the Human AB protein

Media

LB Agar

E Coli

LB broth, culture E Coil

Spot E Coli onto a plate of the LB Agar

- Grow to stagnant phase
- Food for worms!

10%, 1%, .01% ,Caffeine (positive control), PBS (negative control)

Grown with
Brahmi from egg
to L4 (larval)

Grown With Brahmi
From L4 onwards

Grown with Brahmi
entire life from egg
stage

Results



➤ Paralysis

- At 50% of worms paralyzed in PBS what are the paralysis rates in Brahmi?
- Paralysis would tell us if the Brahmi is inhibiting the aggregation of AB proteins in the muscle cells of the worm or...
- If Brahmi is allowing the muscle cells to function normally even with the production of AB

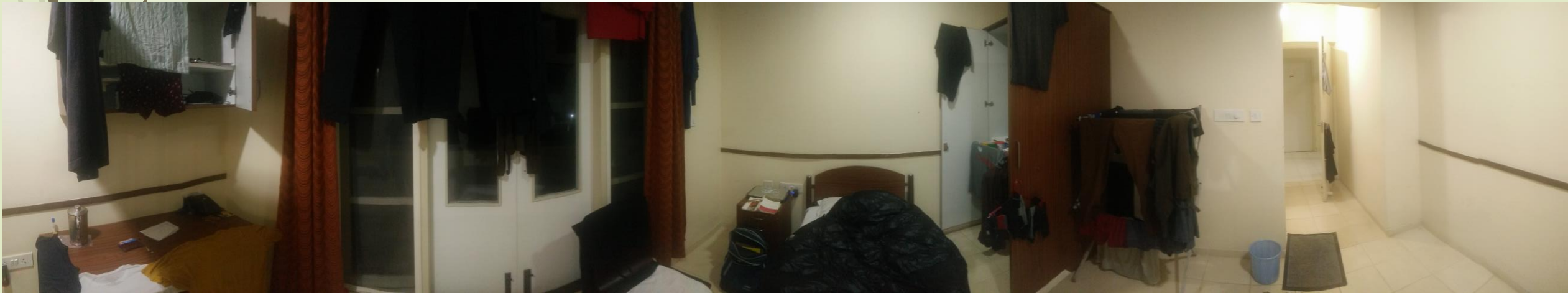
However, not able to get Brahmi to work as the lab and other literature had previously observed.

Results were not matching a concentration dependent curve of efficacy

Thus not able to stain, western blot, PCR or get any usable data

After much frustration, difference batches of Brahmi, harvested in different places, different ages and trials by me, and 2 other PhD students we concluded that there was an issue in the suppliers batch of worms.

Hostel



Hospital, Canteen

- Mango, Avocado, Jackfruit, Pomegranate
- Medicinal plants all labeled, genus, uses, parts used, how to use, etc...





Hospital

- Acupuncture
- Procedures
 - PPS, SSPS, Oil
- Eyes
 - Eye oil treatment
- Geriatrics
 - Cancer patients, GI tract, Menstrual disorders
- Surgery
 - Diabetes, hemorrhoids, fistulas, wounds

Canteen



Extra Curricular: Friends



Sister Daisy and the Boys



Check ups for the Boys

