LABORATORY VALIDATION OF MICROSAMPLING COLLECTION

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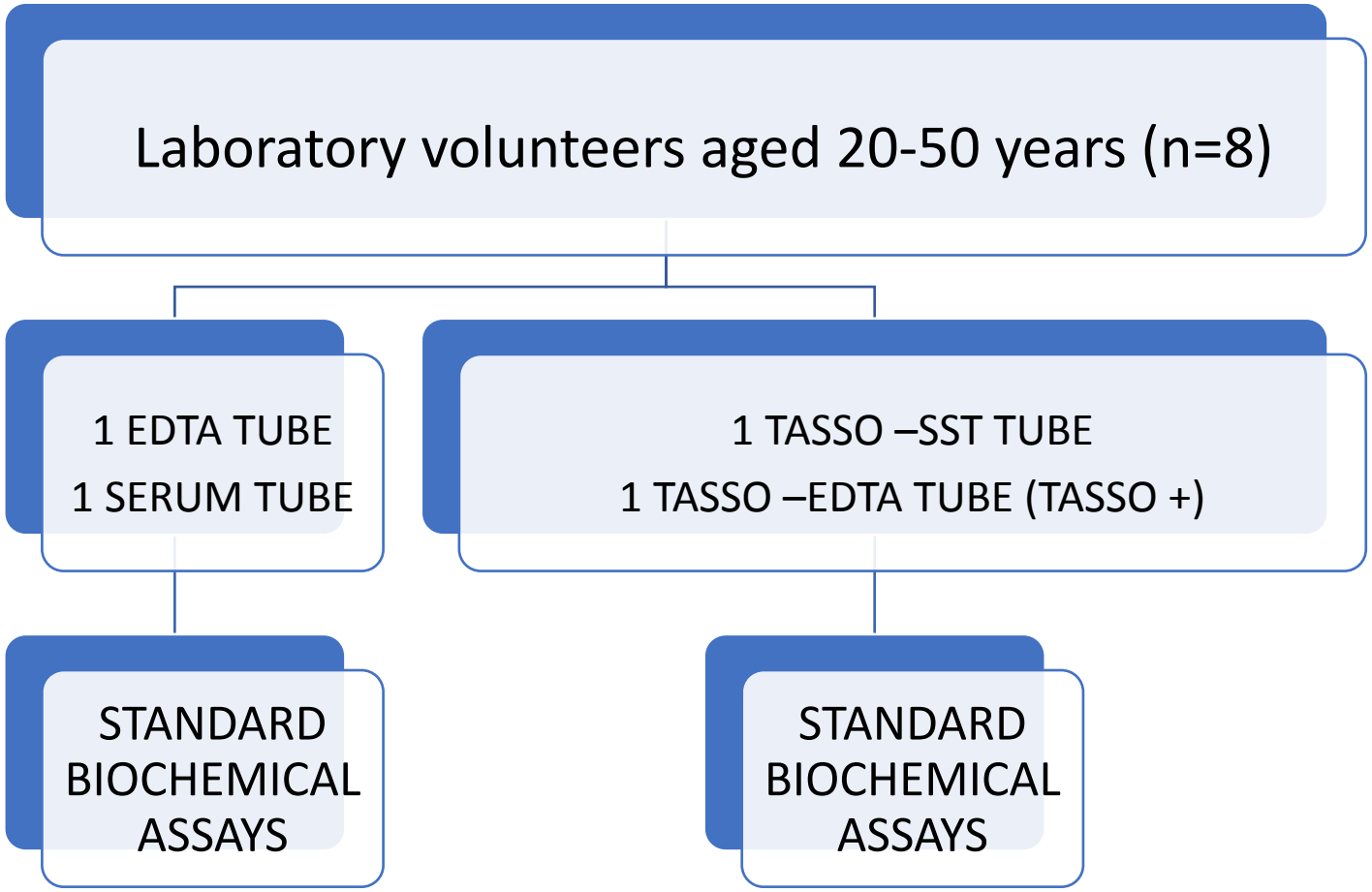
BACKGROUND

- Microsampling techniques allow specimen collection from research participants who traditionally do not consent to blood collection
  - Dried Blood Spots (DBS) remains the most common microsampling technique used.

- Several analytes cannot be reliably measured in DBS
  - Alternate methods for capillary blood collection are being evaluated
  - Tasso devices (Tasso Inc.) where one can collect both serum and plasma (separate devices) from ~500 ul of whole blood is one such alternate microsampling device.

LABORATORY VALIDATION



RESULTS: SST

ANALYTE	REFERENCE	TASSO DEVICE	% BIAS	R^2
LIPIDS				
CHOLESTEROL	204±28	210±32	2.8 (0 - 4.6)	>0.99
HDL-c	61±21	60±21	-2.4 (-1.1 - -3.8)	>0.99
TRIGLYCERIDES	184±157	204±183	9.3 (5 - 15)	>0.99
ELECTROLYES				
SODIUM	138±2	137±3	-0.9 (-1.5 - 2.7)	>0.99
POTASSIUM	4.19±0.36	4.81±0.49	15 (10 - 22)	0.99
CHLORIDE	101±2	99±2	-2.4 (-1.7- -2.9)	>0.99
GLUCOSE	100±11	42±9	-59 (-41 - -65)	0.76
KIDNEY/LIVER BIOMARKERS				
CREATININE	0.75±0.14	0.73±0.11	-2.1 (-1.4 - -9.5)	0.98
BLOOD UREA NITROGEN	12±4	13±4	8.5 (-4.2 - 10.4)	0.98
ALKALINE PHOSPATASE	68±16	68±17	0.4 (-2 - 6)	>0.99
AST	19±4	21±4	9 (4- 12)	>0.99
ALT	20±11	20±10	3 (0- 9)	>0.99
TOTAL PROTEIN	7.35±0.25	7.45±0.17	1.4 (-1.3 – 2.7)	>0.99
ALBUMIN	4±0.32	4±0.21	4 (0 - 8)	>0.99

RESULTS: TASSO EDTA

ANALYTE	REFERENCE	TASSO DEVICE	% BIAS	R^2
CALCIUM	9.42±0.51	9.48±0.50	0.7 (-2 - 2)	>0.99
CYTOMEGALOVIRUS ANTIBODY (IgG)	482±510	492±520	1.3 (-1.4 – 4)	>0.99

CONCLUSIONS AND FUTURE DIRECTIONS

- Microsampling devices such as Tasso that allow collection of whole blood samples give results that are highly comparable with venous blood samples collected via venipuncture
  - Requires modification of procedures used in standard clinical chemistry instruments
- Microsampling devices result in unequal blood volumes
  - There is a small but significant failure rate
- Comparison of capillary blood vs. venous blood for cytokines, proteomics (Olink) and DNA methylation measurements is ongoing

ACKNOWLEDGEMENTS

ADVANCED RESEARCH AND DIAGNOSTICS LABORATORY

- Cassandra Carlson
- Jaime Lavalle
- Laboratory volunteers

UNIVERSITY OF TEXAS - AUSTIN

- Lauren Gaydosh
- Audrey Kelly