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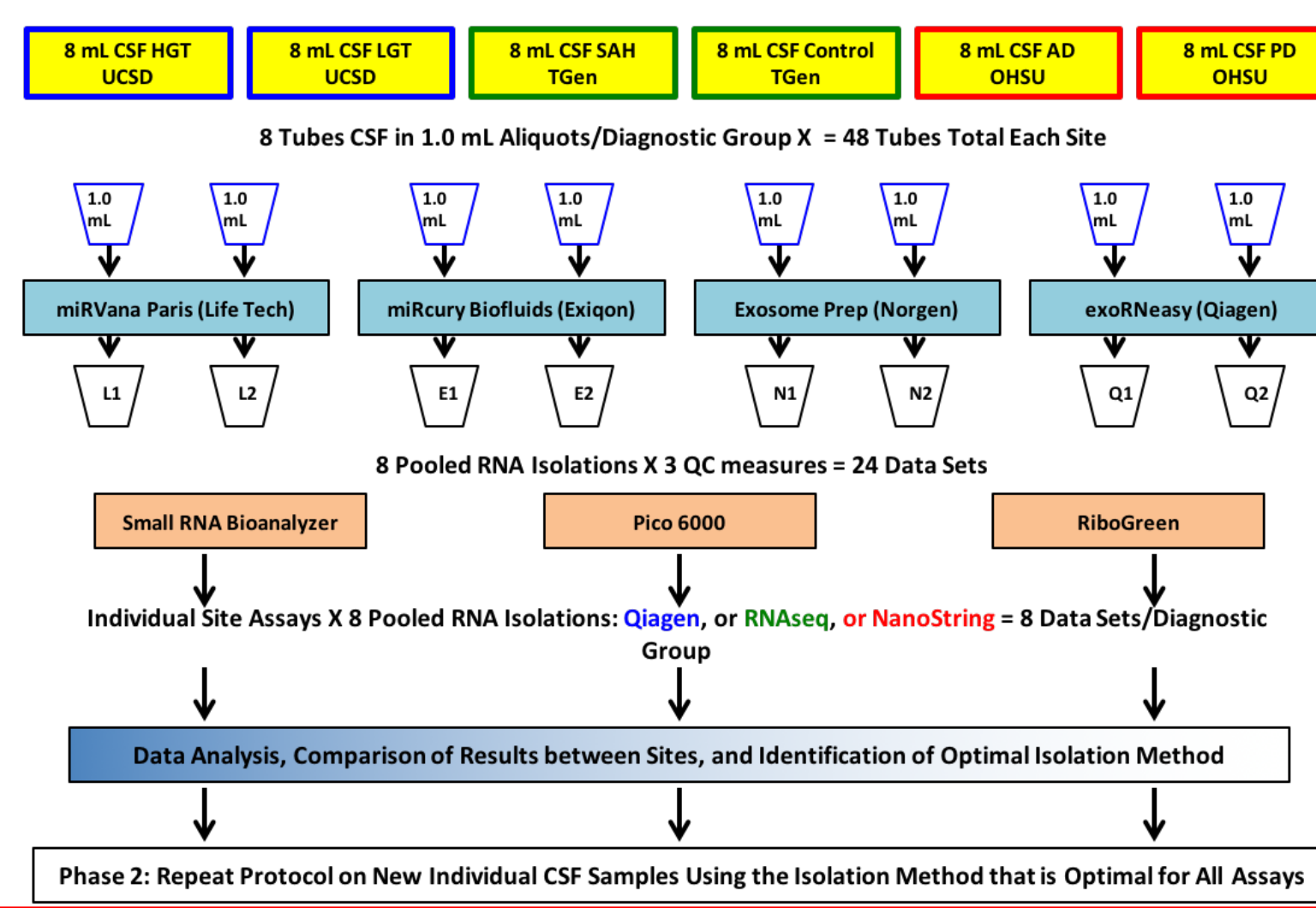
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The **exRNA virtual biorepository (EVB)**, developed by the Resource Sharing Working Group and the Data Management and Resource Repository (DMRR) of the exRNA Communication Consortium (ERCC), facilitates tracking and sharing of biofluids. The shared EVB is key to discovery and validation of biomarkers while providing normative and experimental controls for specificity assessments.

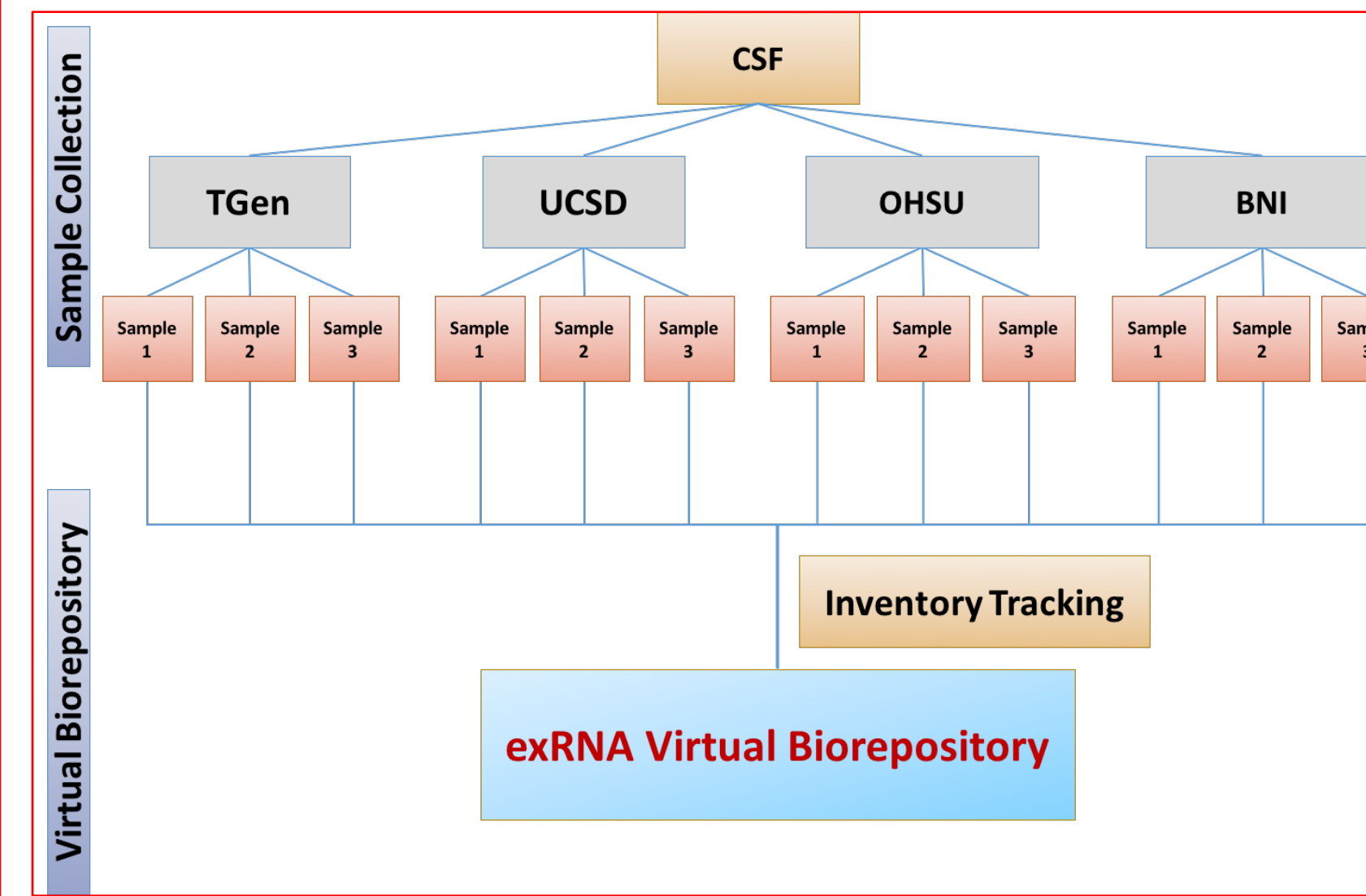
Vision of the exRNA Virtual Biorepository

- Shared biofluid and tissue specimens for the ERCC and research community
- Resource for assessing and validating exRNA biomarkers for
 - Disease diagnosis, prognosis, stratification, toxicity
 - Providing normative and experimental controls
 - Improving biomarker sensitivity and specificity
 - United Common IRBs and uMTAs
 - Optimized and stringent SOPs and site quality control
- Our operating philosophy is based upon the CSF consortium template
- Mindful of the need to determine long-term funding model and transition
 - Work with advocacy groups, commercial, non-profits
 - Guided by Advisory Board of stakeholders

SOP for Collaborative CSF ExRNA Biomarker Studies – Phase 1



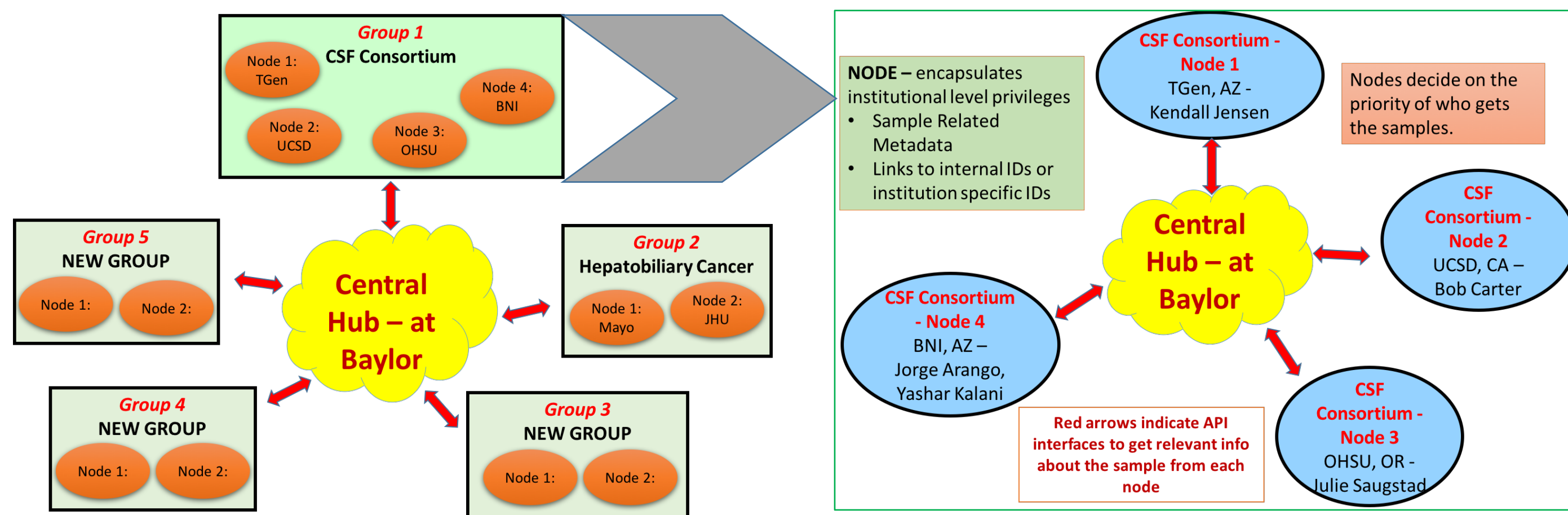
CSF Consortium Architecture



The first 'use case' for the EVB involves the evaluation of CSF for the diagnosis of:

- Primary tumors of brain (**UCSD**);
 - Subarachnoid hemorrhage (**TGen**);
 - Alzheimer's & Parkinson's diseases (**OHSU**);
 - EV profiles of normal CSF;
- EVB also stores CSF samples collected routinely from patients with various neurological conditions (Barrow Neurological Institute, **BNI**).

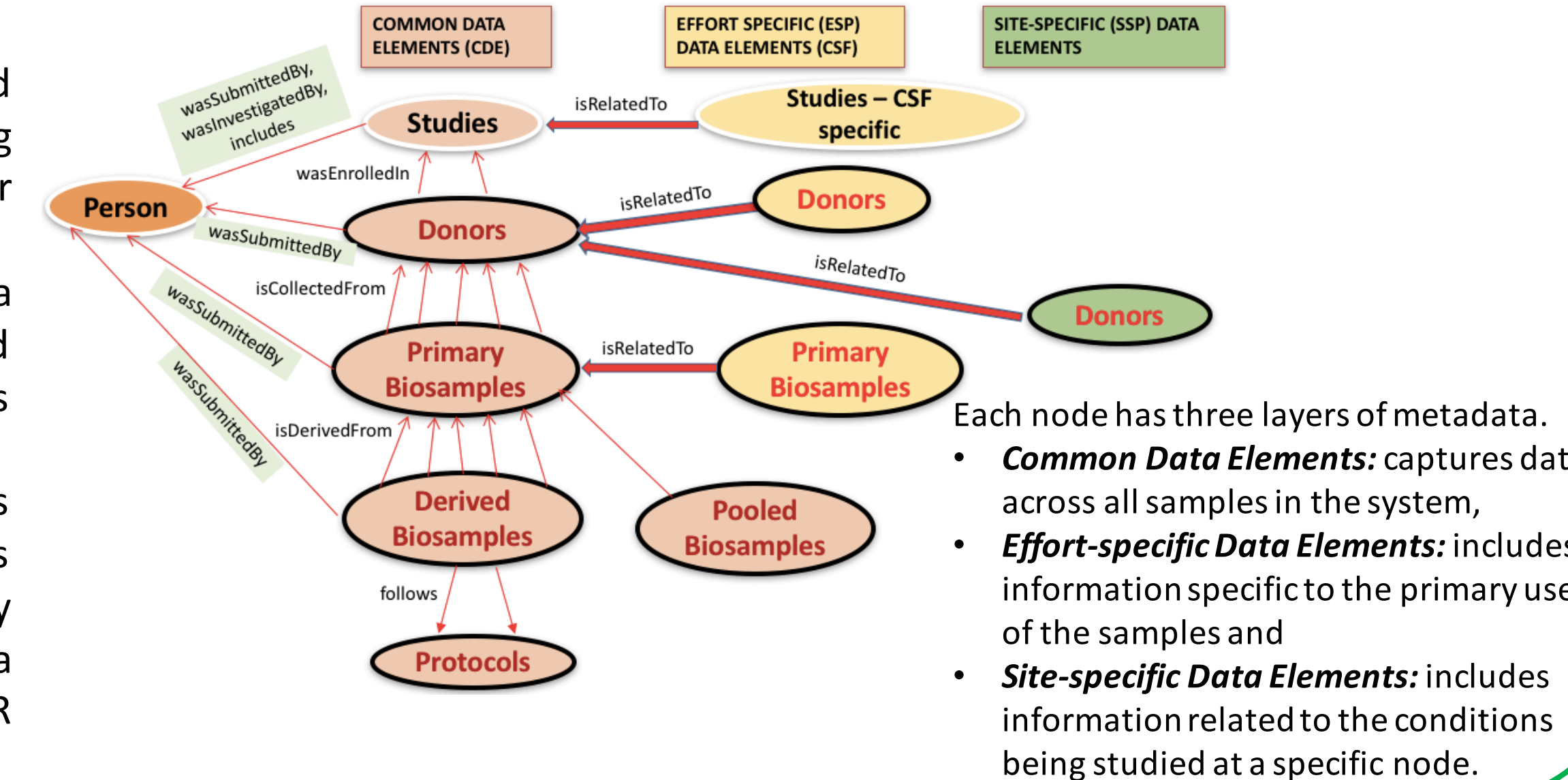
Central Hub and Nodes Model



Built on the **GenboreeKB** framework, EVB offers a distributed and extensible infrastructure ideal for the promotion of collaboration with controlled information sharing. Each institution participating in the EVB possesses a 'node' within the system.

- The local nodes are configurable so that only a subset of non-identifiable data about samples may be shared outside of the collection site.
- For ease of installation, the nodes are pre-configured virtual machines (VMs) and may reside at participating institutions or may be hosted remotely at commercial or private clouds.
- The central EVB hub is a "web service broker" for data query, annotation, requesting and tracking samples and generating summary reports for samples available across the network of EVB nodes.
- Genboree REST Application Programming Interfaces (APIs) that enable standards-based data sharing across physically distributed nodes are projected to be fully compliant with W3C JSON-LD and RDF Linked Open Data standards, thus facilitating data interoperability with EHR and other IT systems.

Metadata Collections and Models



CSF EVB Portal^{BETA} with Summaries, Statistics

Reported Extraction Results

Vesicle Characterization Summary	
Avg. Vesicle Conc. (particles/μL)	12,395,000
Nanoparticle Tracking Analysis	823,899
Flow Cytometry	n/a
Tunable Resistive Pulse Sensing	n/a
RNA Extraction Summary	
Avg. Ribogreen Conc. (ng/μL)	13.86
Avg. RNA Yield (ng/μL)	±14.12
ExoRNeasy Serum/Plasma Maxi (Qiagen)	±0.53
MIRVana Paris (Ambion)	6.31
Total Exosome RNA / Protein (Invitrogen)	±9.59
miRcury Biofluids (Exiqon)	4.54

CSF EVB Dashboard with Biosample Inventory Information

Dashboard

Disease Types	Healthy Control	Subarachnoid Hemorrhage	Alzheimer's Disease	Parkinson's Disease	Glioblastoma Multiforme
# of Primary Biosamples	52	5	54	14	5
# of Donors	50	5	54	14	5
RNA Extraction (#)	8	8	4	7	6
Physical characterization (#)	1	1	1	1	1

# of Primary Biosamples, Healthy Control					
Biosample ID	Diagnoses	Biofluid Name	Sample Collection Method	Collection Tube Type	Remaining Fluid Volume
CDE-JQEB001-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	7.5 ml
CDE-JQEB002-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	8 ml
CDE-JQEB003-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	8.5 ml
CDE-JQEB004-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	8.5 ml
CDE-JQEB005-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	9 ml
CDE-JQEB006-PB	Healthy Control	Cerebrospinal fluid	Lumbar puncture	Polypropylene	9.5 ml

Grid View with Link to See Detailed Report About Biosamples

- Click to view a detailed report view of the:
- Biosample,
 - Donor from whom this biosample was collected,
 - Study for which this donor was recruited,
 - Contact information for requesting samples

Acknowledgements:

- Genboree Dev Team at Baylor:** Andrew Jackson, Neethu Shah, Aaron Baker, William Thistlethwaite, Sameer Paithankar
- Contributors from various institutions:** UCSD: Ryan Kim, Johnny Akers, Douglas Galasko; OHSU: Betty Lind; TGen: Rebecca Reiman, Ashish Yeri; Barrow Neurological Institute: Yashar Kalani, Jorge Arango
- This research is supported by the Supplement Grant **3U54DA036134-03S1** from the NIH Common Fund, through the Office of Strategic Coordination/Office of the NIH Director.