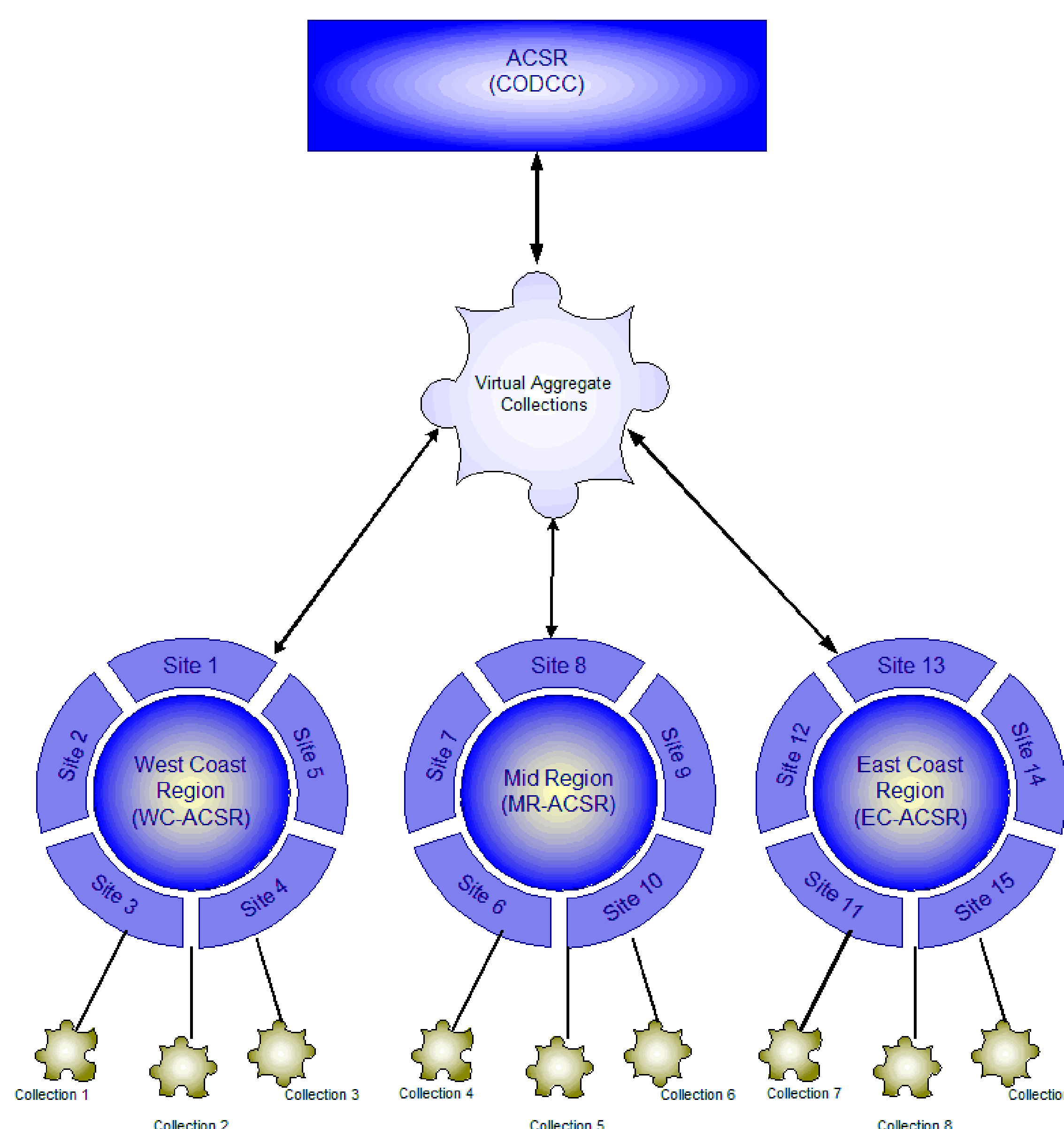


Background

The AIDS and Cancer Specimen Resource (ACSR) was established by the National Cancer Institute in 1994 as a multi-center repository for biospecimens from patients with HIV-associated malignancies. In addition to tissue, blood and other HIV-associated cancer specimens, the resource currently includes specimens for various non-cancer HIV-related diseases as well as HIV-negative control specimens. The ACSR actively collects biospecimens from across the United States as well as from developing countries with a high population prevalence of HIV disease. Samples are well-annotated with accompanying demographic, clinical and epidemiological data available. The breadth of the ACSR's collection is an asset to researchers investigating therapeutic targets and new cancer therapies as well as those pursuing projects to elucidate disease pathogenesis in the HIV-infected population. The ACSR collaborates with individual non-profit investigators and cooperative groups. Collaborators are expected to share their research findings with the scientific community.

The ACSR, through the Central Operations and Data Coordinating Center (CODCC), supports the infrastructure needed to identify, collect, process, store, access, and distribute samples and related data from three regional biospecimen repositories (RBRs): East Coast, Mid Region and West Coast (Figure 1). The ACSR CODCC developed and maintains a central database that acts as an aggregate virtual specimen repository, representing the RBR collections. Each RBR physically manages their collection and via the database, makes them available to the CODCC.

A strength of the Resource is that it has evolved to include access to large HIV-related specimen and data collections including AIDS-related cancer cohort studies. However, coordination and integration of these "special collections" into the Resource has posed a unique challenge for development and management of a versatile and flexible database for the ACSR program. Rules for specimen sharing are specific to each "special collection" and are integrated and managed by the CODCC. Examples of current "special collections" (Table 1) include: 1) Tissue microarrays; 2) San Francisco Men's Health Study; 3) Zambia HHV8/HIV Plasma Collection; 4) AIDS Malignancy Consortium Protocols; 5) Women's Interagency HIV Study (WIHS); and 6) Uganda AIDS Rural Treatment Outcomes.



ACSR Virtual Specimen Repository (Figure 1)

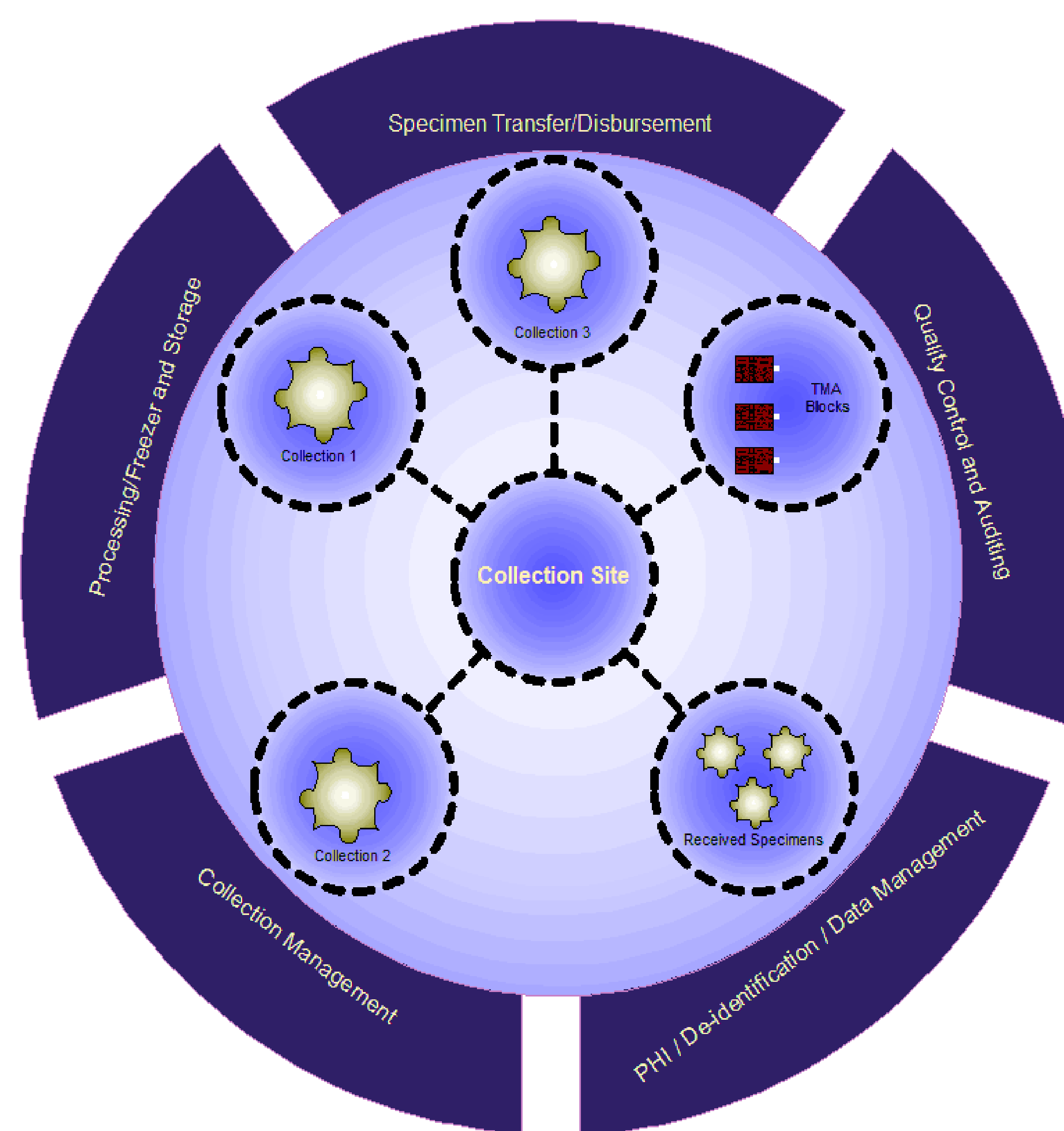
Table 1: Examples of "Special Collections" in the ACSR

Collection Name	Collection Description	Permissions
Women's Interagency HIV Study (WIHS)	Ongoing longitudinal study of HIV+ women	Public/Collaborative Sharing
AIDS Malignancy Consortium (AMC)	HIV+ cases from various AMC protocols	Collaborative Sharing /Locked
Zambian Women's KS HHV8 Study	HHV8, HIV status known	Collaborative Sharing
Colon Cancer Tissue Microarray (TMA)	HIV- colon carcinoma cases. Both cancer and non-cancer control tissue from each case	Public
TMA03-001	Lymphoma	Public
San Francisco Men's Health Study	Longitudinal study of men in San Francisco. HIV status known. Various specimens and clinical data.	Collaborative Sharing
Uganda AIDS Rural Treatment Outcomes	Outcomes of ART in sub-Saharan Africa (Mbarara, Uganda)	Collaborative Sharing

Methods

The ACSR CODCC Standard Operating Procedures (SOP) and Manual of Operation (MOO) were reviewed along with Material/Data Transfer Agreements, and Human Subjects approvals that govern each "special collection." Information was abstracted to construct the algorithms needed to manage database integration of "special collections" data.

Each RBR manages specimens and data collected from their affiliate hospital (clinics, surgery and autopsy, individual donors), from external sites (sub-sites) and from other RBRs (e.g. specimens shared for special projects such as creation of tissue microarrays). In addition, independent researchers/investigators have donated/granted access to their study specimens and data ("special collections") for restricted study-approved use by other investigators. Figure 2 highlights how the RBRs manage their "special collections" and provide services for storage, processing, transfer and disbursement of those samples. Each RBR runs specimen and data QA and QC to ensure specimen quality and data integrity. The RBRs also function as information brokers who maintain site-specific IRB approval and patient consents, and adhere to rules/restrictions of individual "special collections" as dictated by the collection-specific SOP and agreements for release of specimen-related data to outside investigators.



Specimen Collection Management (Figure 2)

Results

The ACSR is a valuable resource for research studies of AIDS-related cancers, particularly due to its unique incorporation of large "special collections" into its biospecimen repository. However, the coordination of these specimen "special collections", each with collection-specific rules for access, sharing and disbursement, has been a very challenging management process for the ACSR. Successful maintenance of the "special collections" has necessitated significant changes in policy, system configuration and modification of the central ACSR database.

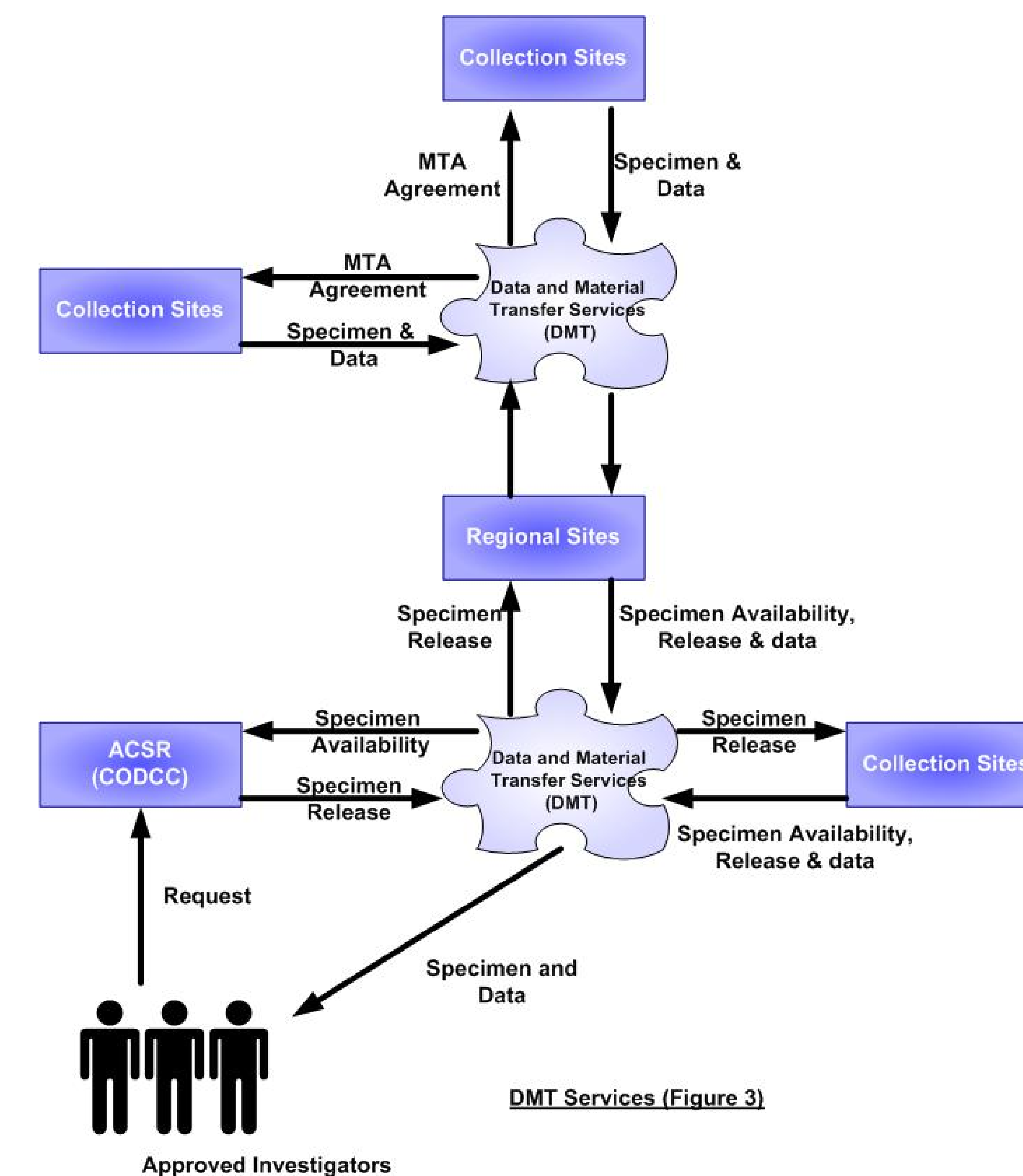
As shown in the proposed attribute table (Table 2), we identified 1) common and unique data elements needed to effectively and efficiently merge "special collections" into the Resource database and; 2) rules required to regulate access, sharing and disbursement of "special collection" samples and data. Thus, database modifications will include elements for collection name, custodian, and dates. Individual collection-specific flexible rules will be overlaid to lock, share, collaboratively share and grant/voke access to specimens individually or in defined groups.

Careful management of "special collections" ensures that information about these study-related collections are transparent to investigators and will encourage future HIV-related research that can optimally leverage these valuable specimens.

Table 2: Proposed Database Attribute Table

Attributes	Definition
ACSR number	Unique tracking number related to subject/Donor subject
Collection Name	Name given to collection
Specimen Identifier	Unique specimen number given by collecting site
Parent Specimen Identifier	Related parent specimen number in case current specimen is a processed component of the original acquired specimen
Site identifier	Identifier of custodian site (Site acquired this specimen)
Date	Date on which specimen was added to collection
Specimen Type	Specimen type Tissue, body fluids etc.
Custodian Identifier	Identifier of custodian managing this collection usually PI
Permissions	Specimen available to Public / Collaborative Sharing/ Locked
Specimen Quality	Specimen quality grading schemes based on specimen type
Original Quantity	Quantity when specimen was acquired
Used Quantity	Quantity used from original specimen quantity
Unit of measure	Based on specimen type
Last used Date	Last date when specimen was checked out for processing
Current status	Available / Discarded / Quality Issues

The ACSR maintains a Data and Material Transfer (DMT) service and as shown in Figure 3, the CODCC, RBRs and other sites can transfer/exchange/collect biospecimens and associated data. The CODCC maintains a virtual specimen collection biorepository that enables them to continually monitor and evaluate their collection relative to evolving research needs and directions, to market the Resource and growth of the ACSR program, to verify specimen availability and to approve disbursement of specimens with associated data for research studies. Investigators are encouraged to address their inquiries directly to the CODCC and can request biospecimens through a formal review and approval process.



DMT Services (Figure 3)

Conclusions

A key responsibility of the ACSR CODCC is to develop and maintain the Resource database to coordinate the receipt and disbursement of biospecimens and data. The "special collections" are an added-value unique to the ACSR that allows researchers an opportunity to access comprehensive established collections. Development of a pre-configured specimen collection file within the new ACSR biospecimen management system that incorporates collection-specific elements and flexible rules will ensure improved access to current "special collections" and the ability to add future collections. This will increase the ACSR's effectiveness in supporting AIDS-related cancer research over the long-term and in initiating collaborative projects that leverage invaluable established resources and the expertise of researchers who are custodians of these collections.