CHARTER OF THE WORLDWIDE PROTEIN DATA BANK

Agreement between

RESEARCH COLLABORATORY FOR STRUCTURAL BIOINFORMATICS PROTEIN DATA BANK (RCSB PDB Organization), Rutgers, The State University of New Jersey, Piscataway, New Jersey, United States

and

The EUROPEAN MOLECULAR BIOLOGY LABORATORY ("EMBL"), an intergovernmental institution established by treaty, headquartered at Meyerhofstrasse 1, 69117 Heidelberg, Germany acting through its UK Outstation the European Bioinformatics Institute ("EMBL-EBI"), located on the Wellcome Genome Campus in Hinxton, Cambridgeshire, UK, operating both the PROTEIN DATA BANK IN EUROPE (PDBe Organization) and the ELECTRON MICROSCOPY DATA BANK (EMDB Organization)

and

PROTEIN DATA BANK JAPAN (PDBj Organization), Osaka University, Osaka, Japan

and

BIOLOGICAL MAGNETIC RESONANCE DATA BANK (BMRB Organization), University of Connecticut, Farmington, Connecticut, United States

Effective from January 1, 2021

CHARTER OF THE WORLDWIDE PROTEIN DATA BANK (wwPDB)

1. Rationale

The Worldwide Protein Data Bank (**wwPDB**) was created to provide an enduring organizational framework for global management and dissemination of public-domain structural biology data.

It is essential for the progress of international science that structural biology data be maintained within a limited number of unfragmented archives, identified herein as *wwPDB Core Archives*.

At present, the **wwPDB** manages three *wwPDB Core Archives*, including the *Protein Data Bank* (*PDB*), the *Biological Magnetic Resonance Data Bank* (*BMRB*), and the *Electron Microscopy Data Bank* (*EMDB*).

It is paramount that facilities for deposition, validation, biocuration, remediation, and storage of public-domain structural biology data in the *wwPDB Core Archives* be managed jointly by the **wwPDB Core Members** with all services provided at no charge to **wwPDB Data Depositors**.

It is equally important that structural biology data stored in the *wwPDB Core Archives* be freely and publicly disseminated by the **wwPDB Core Members** and the **wwPDB Associate Members** without charge or limitations on usage.

wwPDB Core Members and **wwPDB Associate Members** are fully committed to the **FAIR** Principles of **F**indability-**A**ccessibility-**I**nteroperability-**R**eusability, emblematic of responsible stewardship of public domain information.

The **wwPDB Core Members** and the **wwPDB Associate Members** also acknowledge the importance of global equity in the ability to deposit and access data, and the need to have international involvement and collaboration in maintaining the *wwPDB Core Archives*.

This document is a revision of the 2013 **Charter of the Worldwide Protein Data Bank**, which was a revision of the original 2003 **Charter of the Worldwide Protein Data Bank**.

Implementation details regarding matters emanating from the **Charter of the Worldwide Protein Data Bank** (hereafter **wwPDB Charter**), effective as of January 1, 2021, are specified in the **Appendix** to this **wwPDB Charter**.

2. Definition of Membership in wwPDB – Roles and Responsibilities

2.1   **wwPDB Core Members: wwPDB Core Members** share responsibilities for deposition, validation, biocuration, remediation, storage, and dissemination of public-domain structural biology data stored in the *wwPDB Core Archives*.

Current **wwPDB Core Member** organizations are the Research Collaboratory for Structural Bioinformatics Protein Data Bank (RCSB PDB Organization) at Rutgers, The State University of New Jersey, the University of California at San Diego, and the University of California at San Francisco; the Protein Data Bank in Europe (PDBe Organization) at the EMBL-European Bioinformatics Institute; the Protein Data Bank Japan (PDBj Organization) at the Institute for Protein Research, Osaka University; the Biological Magnetic Resonance Data Bank (BMRB Organization) at the University of Connecticut; and the Electron Microscopy Data Bank (EMDB Organization) at the EMBL-European Bioinformatics Institute.

Individual **wwPDB Core Member** responsibilities for deposition, validation, biocuration, remediation, storage, and dissemination of public-domain structural biology data stored in *wwPDB Core Archives* must be agreed upon by all the **wwPDB Core Members**.

Proposals for addition of new **wwPDB Core Members** will be reviewed by the current Heads of the **wwPDB Core Members**.

A **wwPDB Associate Member** may be invited to apply to become a **wwPDB Core Member**, following successful completion of a term of no less than five years as a **wwPDB Associate Member**, with evidence of sufficient technical expertise, adequate infrastructure, and sustainable funding.

A qualified external organization may be invited by the existing **wwPDB Core Members** to become a new **wwPDB Core Member** without first having served as a **wwPDB Associate Member**.

The decision to admit a new **wwPDB Core Member** must be by unanimous vote of the current Heads of the existing **wwPDB Core Members**, supported by a simple majority of voting members of the **wwPDB Advisory Committee**.

To be formally admitted as a new **wwPDB Core Member**, the Head of the Organization and its Institutional Official will be required to sign an addendum to this **wwPDB Charter** committing to the terms in their entirety.

Questions about adherence to the guidelines set forth in Section 4 will be discussed at the yearly meetings of the Heads of the **wwPDB Core Members**, as described in Section 7.4. Serious policy or procedural violations by a **wwPDB Core Member** will constitute grounds for revoking **wwPDB Core Membership**. The decision to revoke the membership of a **wwPDB Core Member** must be by unanimous vote of the current Heads of the **remaining wwPDB Core Members**, supported by a two-thirds majority of the voting members of the **wwPDB Advisory Committee** (excluding the representatives of the **wwPDB Core Member** under consideration for expulsion).

2.2   **wwPDB Associate Members: wwPDB Associate Members** are expected to contribute to some of the wwPDB activities (deposition, validation, biocuration, remediation, storage, dissemination of public-domain structural biology data stored in one or more *wwPDB Core Archives*).

The responsibilities of an individual **wwPDB Associate Member** for deposition, validation, biocuration, remediation, storage, and/or dissemination of public-domain structural biology data stored in one or more *wwPDB Core Archives* must be agreed upon by all the **wwPDB Core Members**.

At the discretion of the **wwPDB Core Members**, an external organization may be invited to apply to become a **wwPDB Associate Member**, following preliminary discussions and successful completion of due diligence and demonstration of sufficient technical expertise, adequate infrastructure, and sustainable funding.

The decision to admit a new **wwPDB Associate Member** must be by unanimous vote of the current Heads of the existing **wwPDB Core Members**, supported by a simple majority of the voting members of the **wwPDB Advisory Committee**.

Questions about adherence to the guidelines set forth in Section 4 will be discussed at the yearly meetings of the Heads of the **wwPDB Core Members** as described in Section 7.4. Serious policy or procedural violations by a **wwPDB Associate Member** will constitute grounds for revoking **wwPDB Associate Membership**. The decision to revoke the membership of a **wwPDB Associate Member** must be by unanimous vote of the current Heads of the **wwPDB Core Members**, supported by a simple majority of the voting members of the **wwPDB Advisory Committee**.

2.3   **wwPDB Federated Members:** A **wwPDB Federated Member** manages one or more *wwPDB Federated Resources* and collaborates with the **wwPDB Core Members** in developing and maintaining data-exchange infrastructure, under a separate **wwPDB Federated Member** agreement between the **wwPDB Core Members** and the **wwPDB Federated Member** governing data exchange, data release, data confidentiality, and related matters.

The decision to admit a new **wwPDB Federated Member** must be by unanimous vote of the current Heads of the existing **wwPDB Core Members**, supported by a simple majority of the voting members of the **wwPDB Advisory Committee**.

Questions arising that concern adherence to the **wwPDB Federated Member** agreement will be discussed at the yearly meetings of the Heads of the **wwPDB Core Members** as described in Section 7.4. Serious violations of the **wwPDB Federated Member** agreement by a **wwPDB Federated Member** will constitute grounds for revoking **wwPDB Federated Membership**. The

decision to revoke the membership of a **wwPDB Federated Member** must be by unanimous vote of the current Heads of the **wwPDB Core Members**, supported by a simple majority of the voting members of the **wwPDB Advisory Committee**.

3. Definition of Terms

3.1   The **wwPDB** jointly manages a number of *wwPDB Core Archives* in support of its mission to provide an enduring organizational framework for global management and dissemination of public-domain structural biology data.

At present, the **wwPDB** manages three *wwPDB Core Archives*, namely the *Protein Data Bank* (*PDB*), the *Biological Magnetic Resonance Data Bank* (*BMRB*), and the *Electron Microscopy Data Bank* (*EMDB*).

Additional *wwPDB Core Archives* may be established after full discussion and unanimous agreement among the **wwPDB Core Members**.

3.2   The *PDB Core Archive* is the single **wwPDB** 3D Structure Data Resource housing experimentally-determined multiscale/atomic structural models (hereafter structural models) plus macromolecular data and metadata, related experimental data and metadata supporting the structural models, chemical reference data, status and summary indices, validation reports, and documentation. For the avoidance of doubt, the *PDB Core Archive* is the single global archive for all structural models jointly managed by the **wwPDB Core Members**.

The jointly-managed PDB exchange dictionary (PDBx/mmCIF) describes the semantics and naming conventions of data in the *PDB Core Archive*. This data standards resource is continuously extended to represent new and evolving methods and technologies after full discussion by and unanimous agreement among the **wwPDB Core Members**. Other data formats and delivery methods may be included in the *PDB Core Archive* after full discussion and unanimous agreement among the **wwPDB Core Members**.

The term *PDB Core Archive* is distinct from websites, browsers, and database-query services that are independently developed by the **wwPDB Core Members** and/or the **wwPDB Associate Members**.

3.3   The *BMRB Core Archive* is the **wwPDB** Biomolecular NMR Data Resource housing molecular data and metadata, NMR experimental data and metadata, and related experimental data. For the avoidance of doubt, the *BMRB Core Archive* is the single global archive for NMR experimental data jointly managed by the **wwPDB Core Members**.

The jointly-managed NMR-STAR exchange dictionary describes the semantics and naming conventions of data in the *BMRB Core Archive*. This data standards resource is continuously extended to represent new and evolving methods and technologies after full discussion by and unanimous agreement among the **wwPDB Core Members**. Other data formats and delivery methods may be included in the *BMRB Core Archive* after full discussion and unanimous agreement among the **wwPDB Core Members**.

The term ***BMRB Core Archive*** is distinct from websites, browsers, and database-query services that are independently developed by the **wwPDB Core Members** and/or the **wwPDB Associate Members**.

3.4   The ***EMDB Core Archive*** is the **wwPDB** Molecular and Cellular Electron Microscopy and Electron Tomography Data Resource housing molecular/cellular data and metadata, experimental electric potential map data, and related experimental data. For the avoidance of doubt, the ***EMDB Core Archive*** is the single global archive for 3D electron microscopy and electron tomography experimental data jointly managed by the **wwPDB Core Members**.

The jointly-managed EMDB-XML exchange dictionary describes the semantics and naming conventions of data in the ***EMDB Core Archive***. This data standards resource is continuously extended to represent new and evolving methods and technologies after full discussion by and unanimous agreement among the **wwPDB Core Members**. Other data formats and delivery methods may be included in the ***EMDB Core Archive*** after full discussion and unanimous agreement among the **wwPDB Core Members**.

The term ***EMDB Core Archive*** is distinct from web sites, browsers, and database-query services that are independently developed by the **wwPDB Core Members** and/or the **wwPDB Associate Members**.

3.5   **wwPDB Core Members** and **wwPDB Associate Members** use the common **wwPDB OneDep** software framework for deposition, validation, and biocuration of 3D structure data and metadata for processing of all incoming structural models and associated experimental data destined for the ***wwPDB Core Archives***. Additional data associated with structural models that is not accommodated through the **wwPDB OneDep** system and is destined for one or more of the other ***wwPDB Core Archives*** may be processed using an appropriate deposition tool designated unanimously by the **wwPDB Core Members**. Remediation of data stored in ***wwPDB Core Archives*** will be carried out using appropriate deposition and specialized remediation software tools designated unanimously by the **wwPDB Core Members**.

3.6   **wwPDB Core Members** will jointly maintain the software infrastructure and safeguard multiple copies of the entire contents of each ***wwPDB Core Archive*** to ensure that no ***wwPDB Core Archive*** data will be lost should one or more ***wwPDB Core Archives*** or **wwPDB Core Members** cease operations for any reason.

3.7   For the avoidance of doubt, the **wwPDB Core Members** and **wwPDB Associate Members** declare that all of the data stored in ***wwPDB Core Archives*** and any locally-stored ancillary data and artifacts (digital or physical provided by depositors, but not included in the publicly-accessible archive) are owned and managed collectively by the **wwPDB Core Members**. Consequently, each **wwPDB Core Member** and **wwPDB Associate Member** affirms that they are responsible for turning over all locally-stored ancillary data and artifacts to the surviving **wwPDB Core Members** in the event that the **wwPDB Core Member** or **wwPDB Associate Member** in question ceases operations as **wwPDB Core** or **wwPDB Associate Member** for any reason.

3.8   A ***wwPDB Federated Resource*** is a public-domain data resource that participates in data exchange with one or more ***wwPDB Core Archives***, under a formal agreement between the

wwPDB Core Members and the **wwPDB Federated Member** governing data exchange, data release, data confidentiality, and related matters.

4. Guidelines and Responsibilities of wwPDB Members

4.1   The **wwPDB Core Members** agree to act as distribution sites of one or more of the *wwPDB Core Archives* as defined from Section 3.1 to 3.4 with identical mirror contents and subdirectory structures. **wwPDB Associate Members** may also act as distribution sites of one or more of the *wwPDB Core Archives* as defined from Section 3.1 to 3.4 with identical mirror contents and subdirectory structures.

4.2   The **wwPDB Core Members** and **wwPDB Associate Members** agree to use common archive-specific systems for accession-code assignment, deposition, annotation, updating, and distribution of the data specific to each *wwPDB Core Archive*.

4.3   The **wwPDB Core Members** and **wwPDB Associate Members** agree to conduct updates to the *wwPDB Core Archives* in a manner so as to ensure that a single version of each of the *wwPDB Core Archives* complying with uniform processing and format conventions is made available at all **wwPDB Core Member** and **wwPDB Associate Member** sites involved in distribution of a particular *wwPDB Core Archive*. For each *wwPDB Core Archive*, a **wwPDB Core Member** (the designated *wwPDB Core Archive Keeper*) will be chosen by the **wwPDB Core Members** to be responsible for maintaining the master copy of the *wwPDB Core Archive* and to ensure that updates are delivered according to agreed schedules.

4.4   The **wwPDB Core Members** and **wwPDB Associate Members** agree that substantive changes in the content or organization of any of the *wwPDB Core Archives* must be unanimously agreed upon by all **wwPDB Core Members**. Changes of this nature will only be made following at least 60 days' notice to the user community.

4.5   **wwPDB Core Members** will jointly maintain the *wwPDB Core Archive* data standards resources.

4.6   All changes or modifications of each of the *wwPDB Core Archive* data standards will be agreed upon by the **wwPDB Core Members** and will be reflected in the version numbers of the data standards resources.

4.7   **wwPDB** will make all *wwPDB Core Archive* data standards documentation publicly available.

4.8   Any **wwPDB Core Member** or **wwPDB Associate Member** may elect to distribute copies of data files contained in one or more of the *wwPDB Core Archives*. When distributing *wwPDB Core Archive* data files, all **wwPDB Core Members** and **wwPDB Associate Members** agree to deliver identical copies of the *wwPDB Core Archive* data files following the format and filename conventions adopted for each *wwPDB Core Archive*. Examples of reserved records and current naming conventions used in each of the *wwPDB Core Archives* are included in the **Appendix** to this Charter.

4.9   All **wwPDB Core Members** and **wwPDB Associate Members** are encouraged to develop their own web sites and views of the data. They may create full or partial mirrors of their web sites. These mirrors must, however, adhere to the guidelines set forth in this document. It is essential

that all **wwPDB Core Members** and **wwPDB Associate Members** clearly identify their membership in the **wwPDB** and specify the provenance of the data coming from *wwPDB Core Archives* and *wwPDB Federated Resources* that are delivered on their own web sites and in their own views of the data.

5. *wwPDB Core Archive* Licensing

5.1   All **wwPDB Core Members** and **wwPDB Associate Members** agree that *wwPDB Core Archive* holdings will be distributed in their entirety under the Creative Commons License CC0 1.0 Universal (https://creativecommons.org/publicdomain/zero/1.0/).

5.2   External parties redistributing *wwPDB Core Archive* information are strongly encouraged to provide attributions to the *wwPDB Core Archive(s)* and individual depositor(s) of any information they redistribute under this licensing arrangement. Recommended attribution styles are provided in the **Appendix** to this **wwPDB Charter**.

5.3   Users of *wwPDB Core Archive* information are strongly encouraged to provide attributions to the *wwPDB Core Archive(s)* and individual depositor(s) of the information. Recommended attribution styles are provided in the **Appendix** to this **wwPDB Charter.**

6. Status of wwPDB Core Members

6.1   If any **wwPDB Core Member** becomes unable or unwilling to fulfill its agreed role as described in this **wwPDB Charter**, the **wwPDB Core Member** in question must exit the **wwPDB**.

6.2   In this situation, a new **wwPDB Charter** must be finalized at the next annual (or an extraordinary) **wwPDB Advisory Committee** meeting (Section 7.4).

6.3   If the exiting **wwPDB Core Member** has particular responsibilities within the **wwPDB**, the remaining **wwPDB Core Members** will identify and redistribute essential activities of that particular **wwPDB Core Member** among the remaining **wwPDB Core Members** or the **wwPDB Associate Members** in a fashion to be unanimously agreed by the remaining **wwPDB Core Members**.

6.4   If any **wwPDB Associate Member** becomes unable or unwilling to fulfill its agreed role as described in this **wwPDB Charter** the **wwPDB Associate Member** in question must exit the **wwPDB**.

6.5   If the exiting **wwPDB Associate Member** has particular responsibilities within the **wwPDB**, the **wwPDB Core Members** will identify and redistribute essential activities of that particular **wwPDB Associate Member** among the **wwPDB Core Members** or the remaining **wwPDB Associate Members** in a fashion to be unanimously agreed by the remaining **wwPDB Core Members**.

7. Operation of wwPDB

7.1   Each **wwPDB Core Member** and their Institution agree to the terms set forth in this **wwPDB Charter** as attested to by their signatures.

7.2   A website for the **wwPDB** will be maintained jointly by the **wwPDB Core Members**. All **wwPDB Core Members** will agree on the contents of this site.

7.3   A **wwPDB Advisory Committee** will be constituted, whose role it is to review policy issues and adherence to the guidelines of this **wwPDB Charter**. It will also serve as the sole **Forum for Dispute Resolution**. The **Terms of Reference** for the **wwPDB Advisory Committee** will be agreed by the **wwPDB Core Members** and detailed in a separate document. The **wwPDB Core Members** will determine best representation of their organization in consultation with their Institutions, and their own oversight committees, advisory boards, and funding agencies.

7.4   The **wwPDB** will have an annual **wwPDB Advisory Committee** meeting at a geographic location determined by the **wwPDB Core Members**. The meeting will be attended by the Heads of the **wwPDB Core Members** and of the **wwPDB Associate Members** and members of the **wwPDB Advisory Committee**. Annual **wwPDB Advisory Committee** meetings may be held virtually under exceptional circumstance as agreed by the **wwPDB Core Members**. The costs of convening **wwPDB Advisory Committee** meetings will be shared equitably among the **wwPDB Core Members**. Prior to each meeting, the **wwPDB Core Members** will agree on an expense sharing plan, invited observers and ambassadors, and the meeting agenda.

7.5   The term of the **wwPDB Charter** will, assuming no review, be ten (10) years. After five (5) years any **wwPDB Core Member** may request review of the Charter and production of a "renewal Charter." If unreviewed at nine (9) years, the **wwPDB Charter** shall in any case be reviewed and a renewal Charter produced. A renewal Charter will come into force upon the termination date of the **wwPDB Charter** or one year after the finalization of a renewal Charter – whichever is earlier. However, if all **wwPDB Core Members** agree, a renewal Charter may come into force earlier, at any point after final execution.

8. Survival of Terms

8.1   Each **wwPDB Core Member** agrees that the **wwPDB Charter** will survive in its entirety notwithstanding cessation of operations or withdrawl of any member signatory for any reason.

8.2   Each **wwPDB Core Member** agrees that the **wwPDB Charter** will survive in its entirety notwithstanding change of name of any member signatory for any reason.

8.3   Each **wwPDB Core Member** agrees that the **wwPDB Charter** will survive in its entirety notwithstanding membership revocation of any member signatory as provided for in Section 2.2.

By signing this charter, all member organizations agree to accept the terms contained within.

RCSB PDB Organization	PDBe Organization	PDBj Organization	BMRB Organization	EMDB Organization
Stephen K. Burley	Sameer Velankar	Genji Kurisu	Jeffrey C. Hoch	Ardan Patwardhan
Name	Name	Name	Name	Name
Signature	Signature	Signature	Signature	Signature
4\12\2021	14 Apr 2021	4/14/2021	4/27/2021	13/4/2021
Date	Date	Date	Date	Date
Institutional Official	**Institutional Official**	**Institutional Official**	**Institutional Official**	**Institutional Official**
Prabhas V. Moghe	Rolf Apweiler	Atsushi Nakagawa	Radenka Maric	Rachel Curran
Name	Name	Name	Name	Name
Signature	Signature	Signature	Signature	Signature
April 12, 2021	13 April 2021	14 April 2021	04/28/2021	13/04/2021
Date	Date	Date	Date	Date

APPENDIX TO THE CHARTER OF THE WORLDWIDE PROTEIN DATA BANK

Effective Date: January 1ˢᵗ 2021

Preamble:

This **Appendix** to the **Charter of the Worldwide Protein Data Bank** (**wwPDB**) is intended to provide information concerning joint management of *wwPDB Core Archives* by the **wwPDB Core Members** and the **wwPDB Associate Members**.

Current *wwPDB Core Archives*: *PDB Core Archive*, *BMRB Core Archive*, and *EMDB Core Archive*. Additional *wwPDB Core Archives* may be included as outlined in the **wwPDB Charter**.

Current **wwPDB Core Members**: RCSB Protein Data Bank (RCSB PDB Organization), Protein Data Bank in Europe (PDBe Organization), Protein Data Bank Japan (PDBj Organization), Biological Magnetic Resonance Data Bank (BMRB Organization), and Electron Microscopy Data Bank (EMDB Organization).

Additional **wwPDB Core Members** may be included as outlined in the **wwPDB Charter**.

Current **wwPDB Associate Members**: None.

wwPDB Associate Members may be included as outlined in the **wwPDB Charter**.

1. *wwPDB Core Archive Keepers.*

Day-to-day management of each of the *wwPDB Core Archives* is the responsibility of a *wwPDB Core Archive Keeper*. The *wwPDB Core Archive Keeper* is the **wwPDB Core Member** appointed, according to the terms of the **wwPDB Charter**, as having primary responsibility for data storage, preservation, and maintenance of a particular **wwPDB Core Archive**, carried out in concert with other **wwPDB Core Members**. The data dictionaries and content defining representation of data in the *wwPDB Core Archives* must be agreed upon by all the **wwPDB Core Members**. The composition and any policy issues related to the *wwPDB Core Archives* must be agreed upon by all of the **wwPDB Core Members**.

Current *wwPDB Core Archive Keepers* are as follows:
    PDB Core Archive: RCSB Protein Data Bank
    BMRB Core Archive: Biological Magnetic Resonance Data Bank
    EMDB Core Archive: Electron Microscopy Data Bank

2. *wwPDB Core Archive* Data Content, File Naming, and Distribution.

2.1 3D structural data stored in *wwPDB Core Archives*.

The *PDB Core Archive* (PDB; wwpdb.org) hosts three-dimensional (3D) atomic and multi-scale coordinate Structural Models, related Experimental Data and related Metadata of proteins, DNA/RNA, and their complexes with each other, and ligands. To be eligible for deposition into the *PDB Core Archive*, the structural model must be determined using experimental data obtained from a physical sample of the macromolecule itself using one or more of the common structure determination methods [*e.g*., Macromolecular Crystallography (MX), Nuclear Magnetic Resonance spectroscopy (NMR), Electron Microscopy (3DEM) and Electron Tomography (ET), Electron Diffraction (ED), powder diffraction, or fiber diffraction; doi:10.2210/wwpdb/doc_policy]. These methods can be supplemented by additional data from other techniques, including, but not limited to, Solution Scattering, Chemical Cross-Linking, Mass Spectrometry, Fluorescence Resonance Energy Transfer, Electron Paramagnetic Resonance Spectroscopy, or evolutionary-covariation data based on multiple sequence alignments.

PDB Core Archive Structural Models can include atomic and multi-scale coordinates.

PDB Core Archive Related Metadata include, but are not limited to, a unique Digital Object Identifier, polymer sequences, chemical descriptions for small molecules, experimental details such as sample preparation, data collection and data processing, authorship, and cross-references to external data resources.

PDB Core Archive Related Experimental Data include, but are not limited to, structure factors or unmerged intensities for diffraction methods, and chemical shifts and deposited and remediated restraints for NMR.

The *BMRB Core Archive* (BMRB; https://bmrb.io/) houses experimental data and metadata from NMR spectroscopy, and structural models of small molecules and short oligomers where they are determined by NMR and cannot be deposited to the *PDB Core Archive* (doi:10.2210/wwpdb/doc_policy). In addition to NMR restraints deposited to the *PDB Core Archive*, BMRB provides remediated versions that are included in both the *BMRB Core Archive* and the *PDB Core Archive*.

The *EMDB Core Archive* (EMDB; emdb-empiar.org) houses electric potential maps and metadata from 3D Electron Microscopy (3DEM) and Electron Tomography (ET) (doi:10.2210/wwpdb/doc_policy).

wwPDB Core Members also support storage of ancillary data in *wwPDB Data Reference Files*. At present they are used for provision of chemical reference data, including the *Chemical Component Dictionary* (CCD, doi:10.2210/wwpdb/doc_ccd) and *Biologically Interesting molecule Reference Dictionary* (BIRD, doi:10.2210/wwpdb/doc_bird), both of which are primarily used to describe chemical components in the *PDB Core Archive*.

The chemical reference data are accessible to all **wwPDB Core Members** and **wwPDB Associate Members** and are used in the **wwPDB OneDep** system for deposition, validation, and biocuration.

Metadata for the ***BMRB Core Archive*** small molecule entries are derived from the CCD, with atom names translated using ALATIS (https://alatis.bmrb.io/) to be both unique and consistent with IUPAC naming conventions. The ***BMRB Core Archive*** maintains translation tables for atom names in the standard NMR-STAR entry files. Metadata for small molecules may be augmented with additional tags, not present in the CCD, that aid interpretation of NMR data.

Day-to-day management of ***wwPDB Data Reference Files*** is the responsibility of a ***wwPDB Data Reference Keepers***, appointed by the **wwPDB Core Members**.

Additional ***wwPDB Data Reference Files*** may be established after full discussion and unanimous agreement among the **wwPDB Core Members**.

Current *wwPDB Data Reference Keepers* are as follows:

> ***Chemical Component Dictionary*** (***CCD***): RCSB PDB Organization
> ***Biologically Interesting molecule Reference Dictionary*** (***BIRD***): RCSB PDB Organization

2.2 File Formats

PDB Core Archive files containing atomic and multi-scale coordinates and metadata are distributed in PDBx/mmCIF as the primary format (defined in https://mmcif.wwpdb.org/).

Identical information is also distributed in secondary formats, including PDBML (ftp://ftp.wwpdb.org/) and RDF (https://rdf.wwpdb.org/pdb). The contents of these files are defined in PDBML schema (https://pdbml.wwpdb.org/), and RDF schema (https://rdf.wwpdb.org/pdb), respectively.

A subset of the ***PDB Core Archive*** is also distributed using the legacy PDB format, where possible.

(For the avoidance of doubt, all secondary format files, including so-called legacy PDB, PDBML, or RDF are products of the archive and not part of the ***PDB Core Archive***.)

Quaternary structure files (characterizing the assembly observed in the experiment) are distributed in the PDBx/mmCIF or PDB legacy format.

MX structure factors and unmerged intensities are distributed in the PDBx/mmCIF format. The content of structure factor and unmerged intensity files is described by the PDBx/mmCIF dictionary (https://mmcif.wwpdb.org).

Chemical shifts from NMR experiments are stored and distributed in the NMR-STAR as the primary format. The content of these files is described by the NMR-STAR dictionary

(https://bmrb.io/dictionary). Restraints used in structure determination by NMR are distributed in software-specific formats. They are also converted into and distributed in the NMR-STAR format. Chemical shifts and restraints are distributed by both the **PDB** and the **BMRB Core Archives**. Other types of NMR experimental data, whether or not they are linked to a PDB entry, are distributed in the NMR-STAR format by the **BMRB Core Archive**.

A subset of the NMR content of the **PDB Core Archive** is also distributed using the secondary NMR Exchange Format (NEF) (https://github.com/NMRExchangeFormat/NEF).

For the **EMDB Core Archive**, electric potential maps from 3DEM and ET experiments are distributed in the CCP4 map format (https://emdb-empiar.org/emschema). Metadata from 3DEM experiments are distributed in the XML format. The content of these files is described by the EMDB XML schema (https://emdb-empiar.org/emschema).

wwPDB validation reports are distributed in the XML (validation schema, doi:10.2210/wwpdb/doc_validation_schema), PDBx/mmCIF, and in PDF formats.

The Chemical Component Dictionary (*CCD*) and *Biologically Interesting molecule Reference Dictionary* (*BIRD*) files are distributed in the PDBx/mmCIF format.

2.3 File Naming

Each entry is assigned a unique accession identifier by one of the **wwPDB Core Archives**. Data files for each entry are distributed with reserved conventional names that contain accession code, content type, and file naming convention with optional compression type: <accession_code>.<file_format_type>.(<file_compression_type>).

The **PDB Core Archive** contains the following files for each entry, omitting the compression type:

Atomic and Multi-scale Coordinate files: <accession_code>.<file_format_type>

(For the avoidance of doubt, all secondary format files, including so-called legacy PDB, PDBML, RDF, or NEF format files, are products of the archive and not part of the **PDB Core Archive**.)

Experimental Data files: r<accession_code>sf.<file_format_type>.(<file_compression_type>) for structure factors, *<accession_code>_mr.<file_format_type>.(<file_compression_type>) and <accession_code>_cs.<file_format_type>.(<file_compression_type>)* for restraints and chemical shifts, respectively.

Quaternary structure files: <accession_code>-assembly<assembly#>.cif.<file_compression_type>
<accession_code>.pdb{1..n}.*<file_compression_type>*

Validation reports: <accession_code>_<optional file_type>_validation.<file_format_type>

PDB Core Archive also includes versioned files (ftp-versioned.wwpdb.org). The file naming convention used in versioned FTP repository exposes the **PDB Core Archive** accession code, major and minor version numbers: <PDB_accession_code>_<content_type>_v<major_version>-<minor_version>.<file_format_type>.<file_compression_type>.

Data files for the **BMRB Core Archive** entries that correspond to macromolecules are distributed with the file naming convention that starts with prefix bmr, followed by **BMRB Core Archive** accession code and file type: bmr<accession_code>.<file_type>.

Data files for the **BMRB Core Archive** entries that correspond to smaller molecules are distributed with the file naming convention that starts with prefix bmse, followed by **BMRB Core Archive** accession code and file type: bmse<accession_code>.<file_type>.

Data files for **EMDB Core Archive** entries are distributed with the file naming convention that starts with prefix emd, followed by **EMDB Core Archive** accession code, file type with or without the file number, the file format type and optional file compression type. The header files might contain the schema version prefixed with 'v; if no version is contained in the header file name, that file is the entry's latest header file.

In the following outline of the files contained in each EMDB entry, the representation of the **EMDB Core Archive** file naming convention curly brackets denote a set of possibilities and the round brackets the optional portions:

Header files: emd-<accession_code_numeral>(-v<schema_version>).xml

Image files: emd_<accession_code_numeral>.png

Primary map files: emd_<accession_code_numeral>.map.gz

Additional maps: emd_<accession_code_numeral>_additional(_<file_number>).map.gz

Half_maps: emd_<accession_code_numeral>_half_map_{1, 2}.map.gz

Masks: emd_<accession_code_numeral>_msk_<file_number>.map.gz

FCS files: emd_<accession_code_numeral>_fsc(_<file_number>).xml

Structure factors files: emd_<accession_code_numeral>_sf.cif.gz

2.4 Data Distribution

PDB Core Archive

The distribution of modified PDBx/mmCIF format data that includes categories from the dictionary category groups DATABASE and AUDIT is prohibited.

This requirement does not prevent other data resources from including *PDB Core Archive* entry_ids as cross-references, where it is clear that they refer to the *PDB Core Archive*.

2.4.1: **wwPDB Core Members** and **wwPDB Associate Members** commit to ensuring that *PDB Core Archive* data are as accurate as possible.

2.4.2: **wwPDB Core Members** and **wwPDB Associate Members** agree that they shall distribute identical *PDB Core Archive* data files from their Member FTP sites and Member Websites in exactly the same form, without data additions or data omissions, or modification of file names, to ensure uniform delivery of identical data by all **wwPDB Core Members** and **wwPDB Associate Members**.

2.4.3: **wwPDB Core Members and wwPDB Associate Members** agree to improve the data quality and integrity of existing entries in the *PDB Core Archive*; these shall be subject to continuous review, correction, and coordinated, timely re-release in accordance with current *PDB Core Archive* versioning practices.

2.4.4 **wwPDB Core Members and wwPDB Associate Members** agree to undertake archive-wide remediation projects to improve data quality, integrity, and representation on a timetable to be jointly determined.

2.4.5: **wwPDB Core Members** agree to create and publicly distribute a "*NextGen* version of the *PDB Core Archive*" (hereafter *NextGen* version), which will contain the following:

(a) all data items distributed in the ***PDB Core Archive*** without any modification of their values; and

(b) additional annotations and associated provenance information described in a common PDBx/mmCIF dictionary. Additional annotations will be integrated into the PDBx/mmCIF format files for individual PDB entries or reference files. Where the annotations cannot be integrated into the PDBx/mmCIF format files for individual entries or reference files, these annotations and provenance data will be presented in separate directories. The provenance information of additional annotations will point to the publication describing the method or, in absence of a publication, it will cite the **wwPDB Core Member**.

2.4.6: **wwPDB Core Members** agree to periodically review the contents of the *NextGen* version to

(a) identify content that should be included in the *PDB Core Archive*. In such cases, the **wwPDB Core Members** will agree on a common process to do so for coordinated release of additional data; and

(b) identify and review possible discrepancies in additional data/annotations contributed to the *NextGen* version by different *wwPDB Core Members*, and attempt to resolve such conflicts; and

(c) identify common additional data/annotations and attempt to unify their respective processes generating such data to avoid the duplication of effort or move processes to the **wwPDB OneDep** system as appropriate.

2.4.7: *wwPDB Core Members* agree that the *PDB Core Archive Keeper* will be responsible for assembling and updating the *NextGen* version and distributing it to **wwPDB Core Members** for public distribution. The **wwPDB Core Member** contributing additional annotations will be responsible for transferring them to the *PDB Core Archive Keeper*.

2.4.8: **wwPDB Core Members** agree that the *NextGen* version will be updated on a weekly basis, using an automated process that operates separately from the update schedule and release processes for the *PDB Core Archive*.

2.4.9: Similar to Section 2.4.2, **wwPDB Core Members** agree that if they distribute *NextGen* data files, they shall distribute identical *NextGen* version data files from their Member FTP sites and Member Websites in exactly the same form, without any data additions, or data omissions, or modification of file names, to ensure uniform delivery of identical data across the wwPDB organization.

2.4.10: Notwithstanding 2.4.2 and 2.4.9, **wwPDB Core Members** can implement website, FTP or programmatic access mechanisms (*e.g.*, REST API or other data-delivery mechanisms) to provide a subset of *PDB Core Archive* and *NextGen* version data or well-defined transformations (*e.g.*, encoding, compression, expansion using the transformations defined in the *PDB Core Archive* and *NextGen* archive file) of wwPDB data products coming from the *PDB Core Archive*, the *NextGen* version, or *PDB Core Archive* or *NextGen* version reference files, provided the data from the *PDB Core Archive* or the *NextGen* version are not modified.

2.4.11: **wwPDB Core Members** agree jointly to complete implementation of the provisions of Section 2.4 in a stepwise fashion. **wwPDB Core Members** commit to publishing a detailed plan for full release of the *NextGen* version with supporting update/release processes with the goal of making the *NextGen* version publicly available within 24 months after the 2021 Charter of the Worldwide Protein Data Bank takes effect. The plan will also provide the exact date when all **wwPDB Core Members** and **wwPDB Associate Members** dealing with the *NextGen PDB Core Archive* agree to be in full compliance and Sections 2.4.5-2.4.10 will come into effect.

EMDB Core Archive

No policy has been established for the distribution of modified *EMDB Core Archive* data at present.

BMRB Core Archive

No policy has been established for the distribution of modified *BMRB Core Archive* data at present.

2.5 Data Redistribution and Data Reuse

2.5.1: A ***PDB Core Archive* entry with a published reference** should be mentioned in the publication using its PDB ID and cited in the bibliography both by its wwPDB assigned DOI and the corresponding structure publication.

For example:

PDB ID: 102L

D.W. Heinz, B.W. Matthews (1993) How Amino-Acid Insertions are Allowed in an Alpha-Helix of T4 Lysozyme doi: 10.2210/pdb102l/pdb
D.W. Heinz, W.A. Baase, F.W. Dahlquist, B.W. Matthews (1993) How Amino-Acid Insertions are Allowed in an Alpha-Helix of T4 Lysozyme *Nature* **361**, 561-564.

2.5.2: A ***PDB Core Archive* entry without a published reference** mentioned in the publication using its PDB ID and cited in the bibliography by its wwPDB assigned.
For example:

PDB ID: 1CI0
W. Shi, D.A. Ostrov, S.E. Gerchman, V. Graziano, H. Kycia, B. Studier, S.C. Almo, S.K. Burley, New York Structural GenomiX Research Consortium (NYSGXRC) (1999) The Structure of PNP Oxidase from *S. cerevisiae* doi: 10.2210/pdb1ci0/pdb

2.5.3: A ***BMRB Core Archive*** entry with a published reference should be cited with its BMRB ID, DOI, and corresponding reference publication.

For example:

BMRB ID: 15000: 10.13018/BMR15000 Cornilescu, G., Hadley, E. B., Woll, M. G., Markley, J. L., Gellman, S. H., & Cornilescu, C. C. (2007). Solution structure of a small protein containing a fluorinated side chain in the core. *Protein science* **16**, 14–19. https://doi.org/10.1110/ps.062557707

2.5.4: A ***BMRB Core Archive*** entry without a published reference can be cited using the BMRB ID, author names, year of release, title, and DOI

For example:

BMRB ID: 15000 C.C. Cornilescu, G. Cornilescu, E.B. Hadley, S.H Gellman, J.L. Markley (2006) Solution structure of chicken villin headpiece subdomain containing a fluorinated side chain in the core doi: doi:10.13018/BMR15000

2.5.5: An ***EMDB Core Archive* entry with a published reference** should be cited with its EMDB ID, and corresponding structure publication.

For example:

EMDB ID: EMD-1001
L.F. Chen, E.Blanc, M.S. Chapman, K.A. Taylor (2001) Real space refinement of acto-myosin structures from sectioned muscle *J. Struct. Biol.* **133**, 221-232.

2.5.6: An ***EMDB Core Archive* entry without a published reference** can be cited using the EMDB ID, author names, year of release, and title.

For example:

EMDB ID: EMD-5200
L. Jin, A. Hodes, W.H. Hui, X. Zhang, X. Zhang, X. Yu, J.F. Miller, Z.H. Zhou (2011) 5.4-Angstrom cryoEM structure of the Bordetella Bacteriophage capsid.

3. Guidelines for wwPDB Core Archive Data Dictionaries and Content Management.

PDBx/mmCIF: The ***wwPDB Core Members*** are jointly responsible for the update and versioning of the PDBx/mmCIF dictionary *via* a public version-controlled repository (https://github.com/wwpdb-dictionaries/mmcif_pdbx). Proposed changes to the dictionary (*e.g.*, new content or reorganization of the content) will be jointly developed by **wwPDB Core Members** in consultation with the community **PDBx/mmCIF Working Group (**https://www.wwpdb.org/task/mmcif**).**

Major updates/reorganization of the PDBx/mmCIF dictionary, that significantly impact existing archival entries, and/or their distribution by individual **wwPDB Core Member** and **wwPDB Associate Member** sites, and/or that require extensive changes to software used in the community and/or that significantly impact other users of the ***PDB Core Archive***, will require unanimous **wwPDB Core Member** approval and will be announced to the wider community with a minimum of 60 days' notice.

A major update will be identified by an increment in the major version number of the PDBx/mmCIF dictionary schema.

The ***PDB Core Archive Keeper*** is responsible for validating the integrity and compatibility of dictionary changes against the ***PDB Core Archive***.

The PDBx/mmCIF Dictionary resource site (https://mmcif.wwpdb.org) provides revision history, search, download, and educational materials.

PDBx/mmCIF Dictionary is the master format used in the ***PDB Core Archive*** infrastructure. All the data categories and items represented using the PDBx/mmCIF format including atomic coordinates, related experimental data/metadata, and chemical reference data, are unambiguously defined in the PDBx/mmCIF dictionary.

These data definitions include relationships among different data categories and allowed data types for all data items in the data categories.

The PDBx/mmCIF dictionary also includes allowed enumerations and ranges of values for individual data items, thereby enabling validation of the data items in each PDBx/mmCIF file across the **PDB Core Archive**.

Chemical reference data (***CCD***/***BIRD***) are jointly managed in a central version control system hosted by the ***PDB Core Archive Keeper*** and maintained through the **wwPDB OneDep** system by the **wwPDB Core Members**.

Validation Schema: The content of validation reports (https://www.wwpdb.org/validation/validation-reports, doi:10.2210/wwpdb/doc_validation) follow the definitions in the XML schema (https://wwpdb.org/validation/schema/wwpdb_validation_v005.xsd). Changes are reflected in the incremented version number (*e.g.*, wwPDB_validation_v001.xsd). The report summarizes the adherence of a structure model and data to a set of community-agreed validation and quality-assessment criteria of the structure and highlights specific concerns by considering the atomic model, the experimental data, and the fit between the atomic/multi-scale model and the experimental data.

NMR-STAR: The NMR-STAR dictionary (http://www.bmrb.wisc.edu/dictionary/) provides an extensive controlled vocabulary for the description of NMR spectroscopic studies of biological systems. It includes the description of experiments, the data generated, and the derived results such as molecular structures, dynamics, and functional properties. NMR-STAR is constructed along the lines of an object/relational model using a subset of the Self-defining Text Archival and Retrieval (STAR) specification.

The **wwPDB Core Members** are jointly responsible for the update and versioning of the NMR-STAR dictionary *via* a public version-controlled repository.

Proposed changes to the NMR-STAR dictionary (*e.g.*, new content or reorganization of the content) will be developed jointly by the **wwPDB Core Members**, driven by biomolecular NMR innovations in consultation with a community **NMR-STAR Working Group**.

Any major update in the schema will be identified by an increment of the major version number.

EMDB Schema: The **wwPDB Core Members** are jointly responsible for the update and versioning of the EMDB schema. Metadata pertaining to an EMDB entry are provided in the header file of the entry.

Proposed changes to the EMDB schema (*e.g.*, new content or reorganization of the content) will be developed jointly by the **wwPDB Core Members** and are driven by the innovations in the field of cryo-3DEM and consultation with the EMDB community.

The content of the header files follow the definitions set out in the EMDB data model (XSD XML schema – https://emdb-empiar.org/emschema/header).

The EMDB data model contains the data that describes the EM or ET experiment from which the EMDB entry is derived, including the hierarchical description of the overall sample composition, specimen preparation, microscope with detectors used, image processing for determining the primary map or tomogram, and other auxiliary files (*e.g.*, half maps, masks, FSC curves) deposited for the entry.

The EMDB header files are distributed as XML files that validate against an EMDB data model.

The changes are reflected in the 4-level EMDB schema versioning number: w.x.y.z (*e.g.*, v3.0.1.3).

The document describing what each level of the EMDB schema version represents and how a value is assigned to levels is located at https://emdb-empiar.org/emschema.

Since each element of the EMDB schema has its counterpart in the PDBx/mmCIF dictionary, the changes to the EMDB model are reflected in the PDBx/mmCIF dictionary categories and items that correspond to EMDB schema changes. Proposed changes to the EMDB schema (*e.g.*, new content or reorganization of the content) will be jointly developed by **wwPDB Core Members** in consultation with a community **EMDB Schema Working Group**.

4. Conventions for wwPDB Core Archive Accession Codes.

wwPDB Core Members use a single system for accession code assignment in conducting deposition, annotation, update, and distribution operations for each *wwPDB Core Archive*.

Accession codes are assigned by the **wwPDB OneDep** system.

For *BMRB Core Archive* entries where NMR experimental data is not present in the *PDB Core Archive* entry, for example if a BMRB entry is created in advance of a structure deposition via the **wwPDB OneDep** system, accession codes are assigned by the *BMRB Core Archive* deposition system.

Accession code assignment practices for each of the current *wwPDB Core Archives* include:

PDB Core Archive: The conventional PDB four-character accession code consists of a number (0-9) followed by 3 letters or numbers. In 2017, the *PDB Core Archive* introduced an extended accession code consisting of 8 case-insensitive alpha-numeric characters prefixed with "PDB_". In the extended scheme, the conventional 4-character accession codes are incorporated as the trailing four characters of the extended codes, prefixed by four zeroes. For example, the extended PDB accession code for entry 1ABC is PDB_00001ABC.

**Chemical Component Dictionary**: The conventional three-character accession code consists of number (0-9) and/or letters, which will be extended to beyond three-characters in the near future.

**Biologically Interesting molecule Reference Dictionary**: The conventional *BIRD* ten-character accession code consists of PRD_###### (#=0-9).

Current practices and policies for assignment of PDB Core Archive accession codes for the wwPDB Reference Files can be found on the wwPDB website, doi:10.2210/wwpdb/doc_policy.

BMRB Core Archive: ***BMRB Core Archive*** uses numerical accession codes (typically 5 digits in 2019). For DOIs and file naming, the accession code includes the prefix BMR or BMSE. For publication purposes and within NMR-STAR files, macromolecular accession codes do not include the BMR prefix, and simply consist of the numerical entry ID. Experimental data for small molecules have accession codes that always include the prefix BMSE.

EMDB Core Archive: ***EMDB Core Archive*** map accession codes have the form 'EMD-XXXX...X' ("EMD-" followed by four or more digits 0-9).

The use of codes resembling ***wwPDB Core Archive*** current and any extended accessions codes by **wwPDB Core Members** and **wwPDB Associate Members** or others in the scientific community is strongly discouraged.

5. Guidelines for wwPDB Core Archive Data Exchange.

wwPDB Core Members and **wwPDB Associate Members** (hereafter referred to collectively as **wwPDB Partners**) use common data processing procedures and software to support greater automation in the preparation and delivery of updates of the ***wwPDB Core Archives***.

Each **wwPDB Partner** is responsible for preparing and exporting data files for release or revision to the appropriate ***wwPDB Core Archive Keeper*** for collation and redistribution.

Responsibility for maintaining the master copy of each ***wwPDB Core Archive*** rests with the designated ***wwPDB Core Archive Keeper***.

PDB Core Archive Data Exchange:
The data for ***PDB Core Archive*** entries to be released in the current cycle, and status information for all PDB entries, are transferred from **wwPDB Partners** accepting ***PDB Core Archive*** depositions to the ***PDB Core Archive Keeper*** (currently, RCSB PDB Organization). All to-be-released structures are made available to all **wwPDB Core Members** for a final round of cross-checking and included in the archive update process.

The **wwPDB Core Members** are committed to streamlining the archive update and release process using the **wwPDB OneDep** system, allowing individual **wwPDB Partners** to transfer all the necessary files to the ***PDB Core Archive Keeper*** automatically without human intervention.

The ***PDB Core Archive Keeper*** is responsible for assembling the FTP area and distributing it to the **wwPDB Core Members**, prior to public release, allowing sufficient time for every **wwPDB Core Member** to prepare their website and other services.

BMRB Core Archive Data Exchange:
All chemical shift and restraint data collected during deposition is exchanged with BMRB. Depositors may add additional NMR experimental data directly to ***BMRB Core Archive*** using

the same *BMRB Core Archive* accession code. BMRB and BMRBj, a Japanese partner of BMRB operated by PDBj, use an automated data exchange protocol to share deposited data.

EMDB Core Archive Data Exchange:
The data for structures to be released in the current cycle, and status information for all *EMDB Core Archive* entries, are transferred from wwPDB Partners to the *EMDB Core Archive Keeper* (currently, EMDB Organization). These data are validated and moved through the archive update process. The updated *EMDB Core Archive* is then made available to the **wwPDB Core Members**, prior to public release, allowing sufficient time for every **wwPDB Core Member** to prepare their websites and other services.

wwPDB Federated Archive Data Exchange:
Data related to *wwPDB Core Archive* depositions can originate from *wwPDB Federated Archives* or be deposited to a *wwPDB Federated Archive* indirectly *via* redirection by the **wwPDB OneDep** system during deposition. Data sharing and data exchange will be described in a series of bilateral agreements between each of the *wwPDB Federated Archive Keeper* and the **wwPDB Partners**.

wwPDB Remediation Projects:
During wwPDB remediation projects, data can be exchanged among **wwPDB Core Members** and **wwPDB Associate Members**. Larger scale updates related to archive-wide remediation take advantage of the data exchange and common software. These larger scale updates require advance notification to the user community (minimum 60 days), wwPDB-wide internal review and testing of remediated data, pre-release testing of new features and changes by external users, special pre-release coordination for data loading for **wwPDB Partner** web resources, and final integration of remediated data within a scheduled data release of the *wwPDB Core Archive(s)*.

6. DOI Issuance for *wwPDB Core Archive* Data Content and DOI Page Maintenance.

Each released entry in the *PDB* and *BMRB Core Archives* will be issued a digital object identifier (DOI) as follows:

- *PDB Core Archive* entries: 10.2210/pdb{PDB_ACCESSION_CODE}/pdb

- *BMRB Core Archive* entries: 10.13018/BMR{BMRB_ACCESSION_CODE} or 10.13018/BMSE{BMRB_ACCESSION_CODE}

DOI issuance will take place as part of the release process for each entry. *wwPDB Core Archive Keepers* will provide metadata to the DOI provider(s) as part of the process.

The **wwPDB Core Members** will jointly maintain a landing page for the *PDB* and *BMRB Core Archive* entries, to which the above DOIs will resolve, as follows:

- *PDB Core Archive* entries:
https://www.wwpdb.org/pdb?id={PDB_ACCESSION_CODE}

- ***BMRB Core Archive*** entries:
https://bmrb.io/data_library/summary/?bmrbId={accession code}

- These landing pages contain a limited amount of information regarding each entry agreed by all the **wwPDB Core Members** (*e.g.*, title, authors, and date of release) and provide links to **wwPDB Partner** web pages as appropriate.

7. Amendments to this Document.

7.1 This document can be amended at any time, by unanimous agreement of the extant **wwPDB Core Members**.

7.2 The contents of this document and supporting wwpdb.org web pages will be reviewed at least once a year by **wwPDB Core Members** to ensure that they are up to date and accurate.

7.3 An update to this Appendix may be prepared upon addition of a new ***wwPDB Core Archive***, by unanimous agreement of the extant **wwPDB Core Members**.

7.4 An update to this Appendix may be prepared upon addition of a new **wwPDB Core Member**, by unanimous agreement of the extant **wwPDB Core Members**.

7.5 An update to this Appendix may be prepared upon addition of a new **wwPDB Associate Member**, by unanimous agreement of the extant **wwPDB Core Members**.