Worldwide Protein Data Bank Advisory Committee (wwPDB-AC)
Report of November 2nd, 2018 Meeting
PDBe, European Bioinformatics Institute, Cambridge, UK

Chair: R. Andrew Byrd Co-Chair: David Brown

Chair-Elect: Peter Rosenthal

PDB Site Representatives (Nominated by wwPDB partner): Paul Adams (RCSB-PDB), Cynthia Wolberger (RCSB-PDB), Gaetano Montelione (BMRB), Arthur Edison (BMRB), Sarah Butcher (PDBe), David Brown (PDBe), Masaki Yamamoto (PDBj), and Tsuyoshi Inoue (PDBj)

***Ex Officio* Community Stakeholder Representatives:** Edward N. Baker (IUCr), R. Andrew Byrd (ICMRBS), Wah Chiu (Macromolecular EM)

wwPDB Members: Stephen K. Burley (RCSB-PDB), Sameer Velankar (PDBe), John L. Markley (BMRB), Jeffrey Hoch (BMRB), Genji Kurisu (PDBj).

wwPDB Regional Representatives: Manju Bansal (India), Jianping Ding (China; not present)

Institutional Representatives: Gerard Kleywegt (EMBL-EBI)

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wwPDB AC Meeting, November 2, 2018:

wwPDB Vision Statement

Sustain freely accessible, interoperating Core Archives of structure data and metadata for biological macromolecules as an enduring public good to promote basic and applied research and education across the sciences.

wwPDB Mission Statement

- Manage the wwPDB Core Archives as a public good according to the FAIR Principles.
- Provide expert deposition, validation, biocuration and remediation services at no charge to Data Depositors worldwide.
- Ensure universal open access to public domain structural biology data with no limitations on usage.
- Develop and promote community-endorsed data standards for archiving and exchange of global structural biology data.

This Vision and Mission statements are updated from 2017 to reflect the restructuring of the wwPDB organization, which was presented, discussed, and approved at this wwPDB AC meeting.

The Worldwide Protein Data Bank Advisory Committee (wwPDB-AC) and the leadership of the Research Collaboratory for Structural Bioinformatics (RCSB-PDB), the BioMagResBank (BMRB), the Protein Data Bank in Europe (PDBe), and the Protein Data Bank Japan (PDBj) met at Maddingley Hall, Cambridge, UK on November 2nd 2017.

The agenda included:

1. Introduction and overview of the wwPDB
2. wwPDB status and organizational updates
3. wwPDB vision, mission, and scope
4. wwPDB community engagement
5. PDB Core Archive plans
6. Questions for the AC and general discussion
7. Executive session and feedback

Introduction and Overview of the wwPDB (Presenter: Velankar)

Members of the AC were welcomed by the wwPDB PIs. This year represents the first operation under Terms of Reference agreed to at the wwPDB AC meeting in 2017, wherein the term of R. Andrew Byrd will conclude with this meeting. Peter Rosenthal, Francis Crick Institute, UK, is serving as Chair-elect and will assume the duties of Chair

following this meeting. David Brown, University of Kent, UK served as Co-chair of this meeting.

The wwPDB has had a very successful year since the past meeting in October 2017 at Rutgers University. In addition to overseeing the continual and steady growth of the archive at wwPDB, the partner PIs have undertaken important updates and changes to the wwPDB organization through enhancements of the Vision and Mission Statements, and the definition and establishment of an overarching structure for the wwPDB to include the definitions of Core Archive and Federated Archives.

Important milestones to note are:

1. The RCSB PDB partner received renewal of funding for the period 2019-2023, with an increase in support.
2. The BioMagResBank (BMRB) partner received a very positive review and anticipates at least renewed flat funding. A succession plan is in place for leadership of BMRB.
3. The wwPDB partners collectively continued enhancement of the OneDep system for three modalities: Macromolecular crystallography (MX), NMR, and three-dimensional EM (3DEM).
4. With the restructuring of the wwPDB, BMRB is designated as a wwPDB Core Archive.
5. Three-dimensional electron microscopy (3DEM) structure depositions continue to show rapid growth, and the wwPDB is actively engaging this community.
6. The Electron Microscopy Data Bank (EMDB) at EMBL-European Bioinformatics Institute (EMBL-EBI) has been invited to join the wwPDB as a Core member and the EMDB will become a wwPDB Core Archive. The wwPDB-AC enthusiastically supports this action.
7. wwPDB implemented versioning of entries in the PDB archive with announcements and information on the websites.
8. The PDB-Dev prototype system continues to show growth in depositions for archiving Integrated/Hybrid Method (I/HM) structures and is a proactive development for the wwPDB partners.

The growth of the PDB Core Archive continues to be very strong (with ~12,100 depositions anticipated in 2018), and its impact on the general scientific and lay communities, in addition to the structural biology community, reflects the prominent role of this resource in all scientific communities. The PDB Core Archive provides more than 1.8 million downloads per day. This impact was realized in the RCSB PDB review process and bodes well for other partners in the future. With more than 140,000 structures, growth continues to be very rapid in 3DEM (with ~1400 depositions anticipated in 2018) and MX depositions. While NMR structure depositions remain steady, data pertaining to other types of NMR studies are increasingly flowing into the BMRB. The OneDep system continues to show success in managing the increased number of depositions and enabling balancing of entry processing across all wwPDB partners.

The wwPDB partners are on generally sound funding status as of this meeting. The RCSB PDB funding has been renewed; the BMRB funding is awaiting notification of the renewal; and the PDBe, PDBj, and EMDB will each undergo renewals in 2020, 2022, and 2024, respectively. The cooperativity and enhancements of the enterprise are deemed strong elements that each partner can draw upon while meeting their individual funding application requirements. These efforts will be enhanced by the updates presented for the wwPDB organization.

Outreach activities were strong in this year, with participation in international conferences, engagement with community-based Task Forces and Validation Groups, and publication of important papers describing the validation of structures in the PDB and the OneDep system. A new publication in Nucleic Acids Research (October 2018) is anticipated to become the up to date, preferred citation for the PDB Archive.

The wwPDB Foundation is an entity that works with the wwPDB and acts to support outreach activities of the wwPDB that are not, and cannot be, supported by the individual partner funding sources. As such, the wwPDB Foundation serves to promote activities regarding outreach and sustainability, an example of which will be fundraising and efforts to promote the 50th anniversary of the PDB in 2021.

An important aspect of the operation of the wwPDB is the resource sharing by partners to accomplish the tasks of the international consortium ranging from software development, production maintenance and management, setting and testing requirements for software and data delivery, archive keeping, biocuration and remediation. The wwPDB partners presented tables that outlined the resource sharing by FTEs. In general, the sharing is balanced and proportional to the scale of responsibilities and project size for each partner. Events encountered with staffing in relatively small operations, such as these partners, can have considerable impact, as noted by the temporary loss of one FTE at the PDBe site, which has pushed back some OneDep activities (particularly ligand validation) to be delivered in 2019/2020. Similarly, the funding renewal of BMRB has consequences on the resource allocation from this partner, and the wwPDB-AC is hopeful that a successful outcome will positively impact the developments associated with the NMR Exchange Format (NEF) and NMR restraint validation activities.

The wwPDB-AC was pleased with announced progress in the following areas:

1. Extensions to the PDBx/mmCIF dictionary to better support serial femtosecond crystallography (SFX) and X-ray free electron laser (XFEL) experiments.
2. New agreed procedures among partners for the management of the PDBx/mmCIF dictionary and inclusion of all partners in the process.
3. The invitation of EMDB to join the wwPDB as a full member. It is hoped that this can be completed with the official restructuring of the wwPDB agreement early in 2019.

The progress report for OneDep, one of the major joint activities participated in by all partners, demonstrated sound project management. The project remains largely on track, with some concerns in slippage of tasks associated with ligand validation, NMR restraint validation, and EM map validation. The wwPDB-AC supports and encourages the partners to promptly address resource issues that impact these tasks. The PIs are addressing the difficulties with 'single point of failure' where the status of a single staff member can impact project delivery.

The wwPDB-AC strongly supports the management team structure for the OneDep project and was supportive of continuation of this team and the plans for bi-annual face-to-face meetings of the team.

The overall biocuration progress has showed a steady and impressive increase in efficiency since the launch of OneDep in mid 2014. Realizing that there is inevitably a limit to these efficiency gains, the partners recognize the implications based on future growth of the PDB Archive through increased depositions, especially from Asia, and the necessity of moving forward with identifying new regional partners.

Remediation projects remain in progress for carbohydrates associated with PDB entries, where RCSB PDB will act as the lead organization, and post-translational modifications, where PDBe will act as the lead organization. Both efforts are enthusiastically supported by the wwPDB-AC. Discussion regarding carbohydrate remediation indicated that the wwPDB was appropriately engaged with the glycol-community and coordination is effective. It is understood that priorities have been placed on wwPDB partnership activities, and the AC encourages the PIs to return to these goals as soon as resourcing issues permit.

A set of goals have been reforecast to 2018/2019 implementation:

1. Improvement in weekly release procedures and automation of these tasks is strongly supported, as this impacts the overall project efficiency and FTE utilization for new tasks.
2. Implementation of DOI resolution to a single web page on the wwPDB site with links to partner web sites has been previously approved and supported. The wwPDB-AC recognizes the resource issues that have delayed implementation and, yet, remain highly supportive of this development.
    - *The wwPDB-AC asks that the community be made aware of this action when it becomes effective.*
    - *The wwPDB-AC recommends that wwPDB urge journals to include this DOI information in their 'Instructions to Authors'.*
    - *The wwPDB-AC recommends that when this information is published on the website, there should be information to CLEARLY annotate the deposition that there is a DOI but NO publication associated with the entry.*
3. The issue of locating potential new regional wwPDB partners was raised and discussed.

a. Representatives in India continue to explore the feasibility of obtaining funding and making a proposal to the wwPDB.
b. Uncertainty has ensued for potential partners in China. Discussion reviewed options for the wwPDB, and the AC strongly encourages expansion of the exploration to consider options in Asia including mainland China as well as other opportunities (e.g., Singapore).
c. The wwPDB-AC shares concerns with the PIs that the time required to get an Associate Member operational and managing depositions may be a few years, and the imminent deposition pressure on PDBj by activities in Asia indicate that this issue be addressed urgently.
    - *Members of the AC agreed to assist in the search for suitable partners to establish one or more additional regional data centers in Asia.*
    - *The AC requests that the status of these activities be reviewed at the next AC meeting.*

Updating the wwPDB – Vision, Mission, Scope (Presenter: Burley)

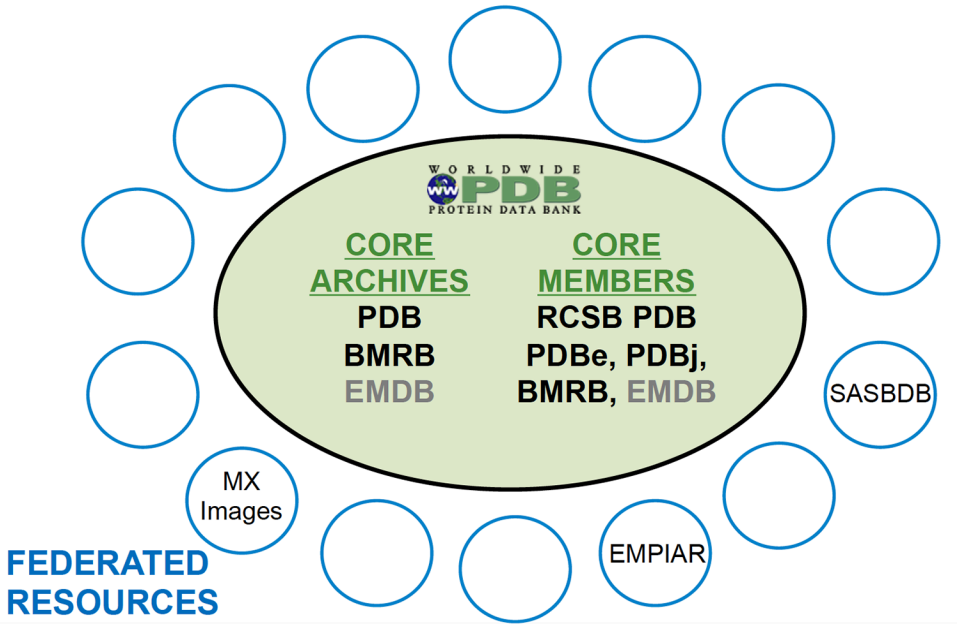
The wwPDB organization has been in existence since 2003, with an update to the agreement documents by the partners in 2013. In recognition of the growth and complexity of the archive, the partners have wisely (in the view of the AC) undertaken a review and re-casting of the agreements and organizational structure of the wwPDB. The new structure of the wwPDB is aimed at preparing the organization for the next 'decades' of operation by re-envisioning the interoperability of the PDB archive with new data resources and new experimental modalities. This process has also led to re-envisioning of the structure of some aspects of the wwPDB operation, as was reviewed by the Presenter. It was critical that these activities be undertaken and completed in order to welcome the EMDB as a partner in the wwPDB, which has caused a minor delay in the completion of that activity.

Additional motivations to the re-organization include:

- Expansion of the structural modalities to go beyond NMR and MX to include immediately cryoEM and hybrid combinations of methods
- Need to coordinate the use of specialized structural biology data that may be outside the mandate of the PDB archive
- Need to establish formal agreements governing the data exchanges that have already been put into practice with EMDB and the SASBDB operations, prior to their joining or becoming affiliated with the wwPDB.
- Clarification of the relationship of the BMRB archive with the wwPDB.

New statements of the wwPDB Mission and the Vision were presented and will be posted on the wwPDB website.

The new organizational structure for the wwPDB includes these main components:



1. Core Archives: Global structural biology data resources, jointly managed by wwPDB Core members. These data archives are currently the PDB and BMRB data archives, and will include the EMDB data archive as soon as all legal reviews are completed and signatures obtained. The establishment of the entity – core archive – envisions the data as a central component of the wwPDB, for which it is responsible to curate and maintain, and envisions potential future expansion to include new data types/resources.
2. Archive Keepers: A wwPDB Core Member appointed to have primary responsibility for storage, preservation, etc. of a Core Archive carried out in agreement with other wwPDB Core Members.
    - There are currently two Archive Keepers
        PDB Archive Keeper: RCSB PDB
        BMRB Archive Keeper: BMRB
    - Forthcoming Archive Keeper
        EMDB Archive Keeper: EMDB
3. Core Members: This entity is equivalent to the present wwPDB partner, wherein the Core Member contributes to all wwPDB partnership activities according to the wwPDB Agreement. Once the new wwPDB Agreement is concluded, Core Members will include RCSB PDB, PDBe, PDBj, BMRB, and EMDB. It is conceivable that additional Core Members will be brought into the organization as scientific research and directions evolve in the future.
4. Associate Members: A group who contributes to some wwPDB partnership activities according to the wwPDB Agreement, with the goal of becoming a wwPDB Core Member. There are no current Associate members, yet, as discussed elsewhere in this report, expected additions may be PDB-China and/or PDB-India.

5. wwPDB Advisory Committee: Under the existing Terms of Reference, the Advisory Committee will continue with the current formulation with the following changes:
    - Each Core Member places two representatives on the AC, such that with the addition of EMDB as a Core Member, the AC will expand to include two new representatives.
    - Organizational representatives will be expanded to include the IUCr, ICMRBS, and the EM community.
    - As Associate Members are established, they will each have one or 2 observers on the AC, which will replace National Representatives from China and India (currently 1 each).

        Discussion in the AC expressed concern that the AC could be reaching an unwieldy size, and the AC recommends that Associate members have one representative, until progressing to Core membership.
6. Federated Resource: A Federated Resource is a structural biology data resource that participates in data exchange with one or more Core Archives. The existence of data resources that have a direct relationship with a wwPDB Core Archive, but may not represent the Core Archives, will be affiliated with the wwPDB and enable combinations, cross-referencing, and other interoperability features that benefit all components. Examples of such resources already in existence and working with the wwPDB are MX Images, EMPIAR, and SASBDB. There are no current official Federated Resources; however, the SASBDB and EMPIAR are expected to align with wwPDB under this definition.
7. Federated Member: Each Federated Member manages one or more Federated Resources and collaborate with Core Members to develop and maintain data exchange infrastructure. There are no current Federated Members; however, the SASBDB and EMPIAR are expected to align with wwPDB under this definition.

The wwPDB-AC was enthusiastic regarding the re-organization, and a constructive discussion raised several issues for the PIs to consider:

1. With two imminent candidates for the Federated Resources, the specifics of this entity will be worked through in the coming year. *Updates or issues associated with the current model should be communicated with the AC via the Chair*.
2. The role of PDB-DEV in addressing the concerns of the structural biology community with respect to multiscale/atomic structural models and integrated/hybrid methods was reviewed. This activity is a prototype system that provides the facility to develop necessary infrastructure before it is integrated into OneDep with structure models deposited into the PDB archive. The AC noted that there is similarity with EMPIAR as well. It was deemed appropriate that the restructuring of the wwPDB will facilitate and foster this development.
3. The AC expressed some concerns regarding:
    a. The consequences of a Federated Resource ceasing to operate. The wwPDB PIs are cognizant of this issue, and the potential

implications *The AC requests that this be considered further and shared with the AC through the Chair*.

b. The complexity of numerous bilateral agreements with Federated Resources, the role of the AC to provide some oversite on an expanding structure, and organizational creep. The partners have a clear grasp on these issues and further discussion will ensue in the next wwPDB-AC meeting.

It is anticipated that all hurdles associated with the organizational structure and cooperativity between the partners will be resolved and that the EMDB is projected to become a Core Member by January 1, 2019.

wwPDB Community Engagement and Oversight (Presenter: Velankar)

A review was provided on the mechanisms that the wwPDB partners have historically utilized to engage the structural biology community. These interactions have focused on (i) establishing data standards and improving data quality of the archived data; and (ii) consulting with community experts via Working Groups, Validation Task Forces, and Workshops.

The increasing complexity of the PDB Archive, developments in the structural biology community, and enormous growth in the utilization and impact of the data in the broad scientific and lay community have led the wwPDB PIs to propose an updated, integrated approach to data standards, data deposition, validation, and biocuration across all wwPDB Core Archives.

The proposal is to replace, gradually, the combinations of standing Working Groups, Task Forces, etc., initially with an ***Archiving Steering Group***. This entity will be tasked with oversight of data standards, data deposition, validation and biocuration requirements across all wwPDB Core Archives. Membership on this group will be formed by (i) each wwPDB Core Member will appoint one qualified community member, (ii) each wwPDB Core member will appoint one internal staff member, and (iii) wwPDB Core Members will jointly appoint a Chair (three-year term, renewable) and one of the wwPDB PIs as rotating co-chair (one-year term).

The Archiving Steering Group (ASG) with the wwPDB Core Members will determine and convene teams of qualified experts (Expert Advisory Groups – EAGs) tasked with addressing specific issues and providing recommendations. These EAGs will replace the existing, general VTFs and be time-limited versions of the previous Working Groups. It is anticipated that EAGs will publish recommendations in peer reviewed journals. The Steering Group will meet quarterly and publish meeting minutes. The Steering Group will report annually to the wwPDB-AC, including progress reports on the current EAGs.

The wwPDB-AC is generally supportive of this reorganization with the following comments:

1. The EAGs provide improved task-oriented interaction, timeliness, and feedback from the community. However, there is some concern of loss of broader representation of a given community (whether MX, NMR or EM) to the ASG and the wwPDB Core Members. There is a favorable comparison of EAGs to the Ligand Validation working group.
    - *The AC recommends that the wwPDB PIs consider how to obtain such information within the context of the ASG/EAG format*
2. The wwPDB PIs should identify one or two test cases for the EAG approach. The EM validation may be an initial example of the use of an EAG compared to a standing VTF for the EM community. Another case may be a specific task that has languished under the previous system and serve to test the increased focus for task completion via this mechanism.
    - *The AC recommends that AC-chair be appraised of the establishment of the initial EAGs and that these EAGs be reviewed by the AC at the first AC meeting following establishment.*
3. Some concerns were expressed that time differences between VTF recommendations and implementations have suggested that alternative approaches are required. However, these differences may be resource-driven.
    - *The AC suggests that trial case of one or two EAGs may identify the causes of this observation and lead to improved operation.*
    - *The AC feels that the focused nature of the EAGs may lead to more successful virtual meetings and supports this approach to achieve efficiency.*
4. The identification of focused tasks requiring development of new tools may enable the wwPDB to be a supporter of task-oriented small grant funding applications.
    - *The AC supports the wwPDB involvement in developing novel concepts for new research or tool development and possibly acting as either collaborators in separate funding applications or letters of support to applications from community members who may be part of the EAGs.*

wwPDB Core Archive Plans (Presenter: Kurisu)

A review of the personnel resource commitments made by the partners to wwPDB joint activities was presented. The commitments are proportional to the scale of each partner and there will be additional resource commitments for software development by PDBj, EMDB, and BMRB.

- *The AC supports this distribution of resources and new commitments. The pending leadership succession at BMRB is viewed to be organized and well conceived.*
- *The AC encourages and supports the involvement of BMRB programming and leadership activities to realize implementation of 'pending' developments on NMR validation and utilization of NEF formats for restraint deposition and validation against restraints. Continued interaction with the NMR VTF is strongly encouraged.*

- *The AC recommends continuation of Quarterly Reports from the OneDep team to enable monitoring of Goals and Accomplishments, particularly in light of deferment of ligand validation to the 2018/2019 timeframe.*

Plans for the Core Archive:

1. Electron Density of ligands within PDB depositions: The subject of ligand coordinates and electron density continues to be a concern of the wwPDB PIs, and the proposed plan to include ED map coefficients at the wwPDB FTP site is welcomed. Implementation is scheduled in 2019, and this will have a positive impact on ligand validation.
2. Remediation of entries containing carbohydrates and post-translational modifications (PTMs).
    - *The AC is strongly supportive of the remediation efforts. Discussions at this stage and during prior presentations focused on engagement of the glycomics community regarding carbohydrate remediation. The AC feels that adequate interactions are in place and the project will be led by the RCSB PDB partner.*
    - *The AC strongly supports the decision to define leadership for remediation activities, and the assignment of PTMs to the PDBe partner is well received.*
    - *The timeline for remediation efforts spans 2018-2020, and the AC recommends explicit project reports be provided to either the AC directly at the next annual meeting or to the ASG in their quarterly meetings with a summary report sent to the wwPDB AC Chair.*
3. Versioning: The AC had previously approved a plan for initiating versioning of PDB entries. The wwPDB partners have made improvements in validation of ligands, including Global Phasing software tools, and they propose to begin the versioning implementation for co-crystal structures in the first year.
    - *The trial parameters with respect to permitting only the original depositor to make updates, the number of updates, etc., is acceptable and supported by the AC.*
    - *The AC recognizes that the total number of structures with small molecule ligands that are affected be poorly estimated, and the AC supports the efforts to encourage depositor self-correction as a means to move toward future auto-correction. The scale of the issue may require further consideration at the next AC meeting. These activities are motivated to improve the data quality of the archive for the broader scientific communities that are users of the PDB archive.*
4. The proposed improvement and expansion of the use of ORCiD IDs within OneDep protocols and the encouragement of depositors to back-populate ORCiD for released entries is fully supported by the AC.
    - *The AC supports the continued and expanded use of ORCiD. It further is supportive of activities to coordinate DOI and ORCiD features. These efforts will provide better accreditation to depositors.*

BMRB Core Archive Plans (Presenter: Markley)

The wwPDB announced its plan to have the BioMagResBank (BMRB) be designated a wwPDB CORE Archive. This action is a new development, where previously, the NMR data associated with a deposition was partitioned to provide chemical shifts and restraints to be stored with the coordinate deposition in the PDB archive, while the entirety of the NMR data, which could include much richer data than the minimal

requirement for PDB deposition, would be archived in the BMRB archive. By taking the step to include the full BMRB as a wwPDB Core Archive, the opportunity to provide greater cross-referencing to other data sets is anticipated to be of significant value to studies involving small molecules and ligands. These actions require software development to be done by BMRB in coordination with the OneDep team to achieve interoperability.

- *The AC is in strong support of this action. The further integration of the BMRB archive holds opportunities for completing long envisioned developments in NMR data deposition and validation.*

BMRB announced the development and launching of a new deposition tool/interface named BMRBdep. The BMRBdep tool replaces the legacy ADIT-NMR and will be installed at both the BMRB home location in Madison, WI and at the Osaka branch (PDBj-BMRB) in Japan. This tool has been built using an API that works directly with OneDep and enables a compatible interface that enable structures, associated data for the PDB archive, and additional NMR data to be collected. This system will significantly simplify the collection and validation of NMR-based structure depositions, and it will support and encourage the collection of more NMR data into the BMRB archive. Through this tool, BMRB will continue to handle structures and data of molecules that do not go into the PDB, and the existence of these data (peptides, natural products, small molecules, etc.) combined with the inclusion of BMRB as a Core Archive will support greater interoperability and cross-reference operations. These activities are significant enhancements for the NMR and general structural biology and scientific communities.

- *The AC is very enthusiastic about these developments. The AC recommends continued close cooperation and development between the BMRBdep team and the OneDep team.*

BMRB also described significant efforts to ‘Re-Scope’ the data content, organization, and management in the archive. This activity was part of the recent funding application by BMRB. The activity has defined a range of data areas/types, which is much broader than the structural components of PDB and have identified community leaders to help formulate and direct activities. Of particular import to the wwPDB is the involvement with Integrative/Hybrid Methods and interaction with the I/H Methods Task Force of the wwPDB.

- *The AC is strongly supportive of these developments.*
- *The BMRB and the wwPDB are encouraged to consider means to coordinate these ‘Re-Scoping’ activities at BMRB with future EAGs under the wwPDB.*

A major development at BMRB is the coordination with the NMRbox project at the University of Connecticut. NMRbox is project aimed at the multi-faceted computational aspects of NMR research and structural biology. It poses to provide a single platform where multiple independent software systems (generally developed in academic, non-profit settings) operate for sharing and cross-utilization of data. NMRbox has a strong dedication to reproducibility and continuity of processing environments to provide

stability and avoidance of orphaned data and processing schemes. BMRB and NMRbox are developing workflows and data format consolidation that will enhance data harvesting and deposition to both the BMRB and PDB archives. This development should enhance the data collection from NMR structural studies and the collection of complementary data, such as chemical shift titrations and dynamics studies, that have value to structural investigations but do not themselves constitute a structure deposition to the PDB archive.

- *The AC deems these developments very significant and is highly supportive.*
- *The AC recognizes the opportunity to broaden the amount of data submission associated with NMR depositions and encourages the BMRB and all PDB partners to monitor these developments.*
- *The AC urges continued coordination between the BMRBdep and OneDep teams to insure singularity of goals and compatibility.*
- *The AC feels that BMRB should consider the opportunity to encourage retroactive collection of NMR data associated with depositions, once the BMRBdep tool is operating smoothly and seamlessly with OneDep. This may be through notifications on websites, information to past depositors, etc.*

BMRB has recently undergone a funding review and is anticipating renewal. In the application, a leadership succession plan was developed, and Prof. Jeff Hoch was listed as Co-PI and Co-Head of the BMRB. The transition of Jeff Hoch to take over as the sole PI will occur in 2020. Dr. Markley will retire in June 2020, and he will remain engaged with the project on a voluntary basis. The overlap of leadership combined with the coordination between BMRB and the NMRbox project, for which Jeff Hoch is the PI, and the inclusion of the BMRB as a Core Archive in the new structure of the wwPDB suggests a strong future for the NMR component of the wwPDB.

- *The AC is very appreciative of the years of service that John Markley has provided to both the NMR community and the broader structural biology community, including his participation and service within the wwPDB.*
- *The AC deems the succession plan and developments within this sector of the wwPDB, particularly as it may impact future I/H methods, as excellent actions and steps forward.*
- *Subsequent to the AC meeting, it has been learned that the funding renewal was successful; however, the level was set at 71% of the requesting level. This represents a significant challenge for the BMRB; however, Prof. Markley has communicated that operation through the first year will proceed normally. The BMRB will consider potential actions to pursue additional funding to augment the current status.*

  Further details should be made available to the wwPDB AC Chair following the BMRB AC meeting in the spring of 2019.

Specific Questions/Actions for the wwPDB AC

1. wwPDB Vision and Mission Statements:

- *The AC unanimously accepts the new statements. It is understood that the distinction is made between data managed by the wwPDB PIs and data that may come into Federated Databases.*

2. Invitation to and designation of the SASBDB and EMPIAR as Federated Members and Federated Archives, respectively:
   - *The AC unanimously supports these actions. As the terms of these memberships is still under development and legal review, the AC recommends that the final documents be provided both to the Advisory Committees of each partner during their annual meeting and to the Chair of the wwPDB AC for distribution to the AC members.*
3. Establishment of a wwPDB Data Archiving Steering Group:
   - *The AC supported the principle of establishment of the Archiving Steering Group with the recommendation of review at the next AC meeting. The AC suggested careful consideration of (i) size of the ASG, (ii) proliferation of another sub-group in the wwPDB and advisory system, and (iii) consideration of the need for longer term community development efforts as part of working group activities.*

4. Updated Terms of Reference for the wwPDB Advisory Committee:
   - *The updated Terms are unanimously supported by the AC*
   - *It is recommended that the Terms contain a commitment to diversity representative of the community.*

5. Recommendations regarding selection of a community representative for the EM community:
   - *The discussion and AC members acknowledge that there is no community organization, similar to the IUCr or ICMRBS. The AC recommends that advice be sought (by the wwPDB AC Chair or his representative) from the EM community at the next GRC on Three-dimensional Electron Microscopy and the advice communicated to the AC by the chair.*

6. Guidance with respect to the comment period for making PDBx/mmCIF files mandatory for X-ray structure deposition:
   - *The AC supports announcing the action early in 2019 on the partner websites and in publications from IUCr and the ACA Reflections newsletter. A planned shift to the mandatory requirement effective in 6 months, on July 1, 2019 is supported as long as this is coordinated with the primary software packages and the mmCIF working group, with appropriate tests to ensure a successful roll out.*
7. Individual AC reports from the wwPDB partners:
   - *The AC accepted the reports from all of the partner ACs and thanked the wwPDB for providing this information.*

8. The NMR-VTF brought forward several recommendations, supported by BMRB for action by the wwPDB:

Recommendation 1. Deposition of coordinates. The One-Dep system should be modified to provide the following language to depositors of atomic coordinates: "The wwPDB has accepted the recommendation of the NMR-VTF that depositors of NMR-derived structures provide atomic coordinates for *all residues for which both atomic coordinates and chemical shift data are available*, even though these coordinates may be imprecisely defined by the experimental data".
Recommendation 2. Depositor specification of "well-defined" and "ill-defined" regions. The NMR-VTF recommends that the wwPDB allow depositors to optionally specify the residues or atoms of the biomolecular structure that are "well-defined" across the ensemble of NMR structures, and those that are "ill-defined". This user-provided information shall be stored in the mmCIF file together with the atomic coordinates.
***Recommendation 3. Automated specification of "well-defined" and "ill-defined" regions*.** The NMR-VTF recommends that the wwPDB provide designation of each residue as "well-defined" or "ill-defined", using the program CYRANGE. This information shall be stored in the NMR Structure Validation Report. In the future, this analysis should be extended to nucleic acid and other biomolecular structures, and it may be defined on an atom-by-atom basis.
Recommendation 4. Representative NMR structure*.* The NMR-VTF recommends: (i) The depositor should be allowed to identify a "depositor-designated representative structure", as part of the deposition process, based on alternative criteria to be provided by the user at the time of deposition; (ii) the PDB automatically identify the single model that is most similar to all the other conformers [i.e. the "medoid" model in the ensemble, with smallest average rmsd between it and all (other) models of the ensemble], and designate it as the single representative NMR structure.

- *The AC supported these recommendations and urges the wwPDB to adopt and implement them in 2019.*

Conclusion

The wwPDB AC meeting concluded with a general debriefing and discussion with the wwPDB PIs.

The next wwPDB AC meeting is set for Friday October 18, 2019, in Osaka, Japan.