



## **Submission of Comments on the Consultation Document: Good Manufacturing Practice for Advanced Therapy Medicinal Products**

### **Comments from:**

#### **Name of organisation or individual**

Alliance for Regenerative Medicine (ARM)

The Alliance for Regenerative Medicine (ARM) is the preeminent global advocate for regenerative and advanced therapies. ARM fosters research, development, investment and commercialization of transformational treatments and cures for patients worldwide. By leveraging the expertise of its membership, ARM empowers multiple stakeholders to promote legislative, regulatory and public understanding of, and support for, this expanding field.

ARM convenes all stakeholders with an interest in regenerative and advanced therapies to provide a unified voice for our 250+ member organizations, including companies – especially small- to medium-sized enterprises (SMEs); academic/research institutions; non-profit organizations; patients, and other members of the advanced therapies community. Our aim is to connect all parts of the innovation lifecycle to address the unmet needs of patients, particularly through supporting commercialization objectives via legislative and policy frameworks that enable next generation therapies to reach those who need them. To learn more about ARM, visit <http://www.alliancerm.org>.

As for last year consultation on the same topic, the consultation document on Good Manufacturing Practices for ATMPs has raised significant interest and engagement from ARM members. This contribution represents the consolidated view of ARM members. The full list of members is provided at the end of this document.

Transparency register number ID: 244710319190-73

## 1. General comments

General comments	
Incorporation of GMP for ATMP in the "The rules governing medicinal products in the European Union"	<p>We welcome the aim of this document to provide specific guidance for developers of ATMP. The new Consultation Document has been significantly expanded compared to last year Consultation Document and we have noticed several of our proposed changes have been incorporated, for which we are very grateful. However, one of our main recommendation to design the document as an Annex to the EudraLex Volume 4 of the "The rules governing medicinal products in the European Union" rather than as a separate, stand-alone document has not been followed. ARM firmly believes this document, by reproducing some but not all of Eudralex Volume 4, fails to provide the specific and targeted guidance required by the developers of ATMPs. As a result, we reiterate our previous recommendation that the targeted guidance this document aims to provide on the GMP requirements for ATMPs is incorporated into an Annex of Volume 4, similar to what was done for the blood derived products in Annex 14 or for Investigational medicinal products in Annex 13, for instance. This would enable the text to focus only on the GMP elements that need specific adaptations for ATMPs taking into account the particularities of the individual product types (TEP, GTMP), with clear cross-referencing to other requirements that are common to all medicinal products for human use. This approach would add visibility as it would only deal with the specific elements for ATMPs and it would serve its purpose to act as a clear and comprehensive reference document for all ATMP manufacturers. Subsequent revisions will also be much simplified as these would be limited to changes required due to progress in the field of ATMPs. Volume 4 Annex 14 specifically does this for blood and plasma derived products. Of note, the current document covers aspects beyond solely GMPs, resulting more in a "guide for ATMPs development" than in a purely "GMP for ATMPs" guide.</p> <p>ARM urges the Commission to rethink releasing this as a stand-alone document for the following reasons:</p> <ol style="list-style-type: none"><li>1) Key components from Volume 4 are missing, such as for instance product recall handling and notification. Since many hospitals/university based groups and SMEs developing ATMPs may be relatively inexperienced in GMP and licensing requirements, we believe this will cause confusion and may lead to disparate practices resulting in different quality standards;</li><li>2) A repetition of much of Volume 4 not only leads to unnecessary duplication of work but would require repeated revisions. Indeed, experience shows that the updating of chapters and Annexes in Volume 4 are very frequent meaning that a stand-alone document for ATMPs that duplicates requirements of these chapters and Annexes would be in constant revision. This would not be required if the document were an annex to Volume 4;</li></ol>

## General comments

- 3) A perceived divergence of quality standards over time may arise from global pharmaceutical GMP expectations which could be detrimental to the field;
- 4) As many aspects of GMP are not specific to ATMPs, having 2 sets of reference guides for ATMP and non-ATMP products would invite potential disparities between the two and could cause some difficulties for companies and for Competent Authorities at time of inspection. A separate guidance would prove challenging for developers with diverse portfolios as they will have to manage an overall quality system relying on 2 different systems (ATMPs versus non ATMPs);
- 5) The stand-alone document will be less evident to developers outside the EU.

As it is, the consultation document is very much angled to Cell Based Medicinal Products (CBMP). Gene therapies (not including ex-vivo gene manipulation of CBMPs) would, in general, more typically follow the route of normal biopharmaceutical products and cGMP. Perhaps this could be covered as separate sections in a distinct annex. Cell Based Medicinal Products (CBMP) and Gene Therapy Medicinal Products (GTMP) are clearly distinct, and the GMP implementation is likely to differ considering the nature of each type of product and specific challenges.

### Risk-based approach and other useful examples

The current document is mentioning Risk-based approach. Since the risk-based approach terminology is defined in the EMA guideline EMA/CAT/CPWP/686637/2011 as a broader concept covering product development as a whole (based on the identification of various risks associated with the clinical use of an ATMP and risk factors inherent to the ATMP with respect to quality, safety and efficacy), we recommend to step away from this terminology as it may create confusion or at least clarify the difference. Indeed, the approach considered for GMP specific to ATMP is rather based on an incremental implementation of the GMP to be justified based on appropriate risk assessment. We believe that the elements pertaining to a risk-based approach in the context of GMP should be more clearly differentiated from those to define the appropriate standards of data in a clinical trial or marketing authorisation. It would be useful to review the examples provided in section 2 "Risk-based approach" with this in mind.

Finally, in order to guide the approach further and avoid overuse of the risk-based approach, this guide would benefit from a clear statement on GMPs rules that should not be subject to flexibility (ex: personnel, hygiene, training, etc.)

ATMP manufacturers often have difficulties with the categorisation of materials into Active Substance, Drug Substance, excipient, etc., and on GMO environmental control for GMO's. Whilst this issue is not directly related to GMP, a glossary of terms, with examples, would also be extremely useful to create a common understanding (see also comment below on 'Format and other useful guidance').

General comments	
Lack of clarity on the ATMP status	The guideline needs to acknowledge that at the time a sponsor wishes to manufacture an ATMP for a clinical trial, it may not be obvious that a product is in fact an ATMP. Since the classification process is voluntary and may be ongoing at the same time that CTAs are being filed, the guideline should speak to the fact that the most stringent GMP requirements possible for the product and the stage of development should be applied. It would not help a company to risk assess their GMP activities on the assumption that their product will be classified as an ATMP and later find that it does not meet the definition. Not every product that applies to CAT for ATMP classification is confirmed as an ATMP.
Global harmonisation and consistency with other documents	As per previous consultation, ARM believes that convergence on GMP requirements with other international regions is important to avoid difficulties in mutual recognition schemes and unnecessary delays in commercialising therapeutics. Therefore, convergence, wherever possible, with the GMP requirements in the US and other regions of the world should be considered desirable. As an example FDA requires data retention for 10 years plus the product shelf life, whilst this document requires 30 years after the expiry date of the product.
Format and other useful guidance	<p>We suggest sections on Scope and Principles are added to the introduction of this document to clearly define the following elements:</p> <ol style="list-style-type: none"> <li>1) The scope of the document; for example, the consultation document often discusses broader overarching Quality Management requirements and principles and CMC issues rather than the narrower scope of GMP;</li> <li>2) The aim and the legal position for the document, if this is to remain a stand-alone document;</li> <li>3) Clarity on the Quality standard to be achieved; for example, this document refers to a <i>Pharmaceutical Quality System</i> where as ICH Q10 specifies that a suitable quality standard should be used and this could be a GMP based QMS or could, for example, be EN ISO based.</li> </ol> <p>We suggest examples could be better incorporated into a Q&amp;A document which could be easily updated as the field evolves.</p> <p>A glossary of terms, for example to define what constitutes and active substance, drug substance etc. for these product types, would be extremely helpful.</p> <p>Please note that the specific comments in the text below are made on the premise that this document is stand-alone. Many of these comments would not be relevant if, as we recommend, the GMP for ATMPs was defined as an annex to volume 4,</p>

## General comments

focusing only on the specific aspects for ATMPs and cross-referencing to other sections in Volume 4 for other, undifferentiated, aspects of GMP.

### Process and next steps

If the proposed guidance is a stand-alone document, separate from Volume 4, it is unclear how medicines inspectors will inspect, particularly when companies produce both ATMP and non-ATMP medicinal products. Consequently, there is a potential for disparity between inspections in Member States. To prevent such uncertainty, ARM had previously asked for the guidance document to be approved by the Inspectors Working Group prior to finalisation. We had also proposed a focused meeting, with the participation of the Inspectors Working Group, to discuss these key aspects and ensure patient safety by applying identical quality standards irrespective of the location where manufacturing of the ATMP takes place.

ARM remains convinced of the value of such a meeting and would like to reiterate its request for an interactive meeting grouping together ATMP manufacturers, the Inspectorate Working Group, the EMA and the European Commission before finalisation of the document.

## 2. Specific comments on text

Section and Line numbers	Comment and rationale; proposed changes
<p><b><u>1. Introduction</u></b>            General:</p> <p>Line 109:</p> <p>Lines 116 – 117:</p> <p>Lines 135-136:</p> <p>Lines 137-143:</p>	<p>The text does not include some key GMP related documents such, as for example, product recalls handling and notification. This would be remedied by referencing Volume 4 fully or by incorporating it into Volume 4 as an annex.</p> <p>Typographical error: 'is' should be replaced by 'are'.</p> <p>It is unclear how production consistency is considered dependent on the stage of development. We believe an improved wording could be "based on available data depending on the relevant stage of development" implying that in the case of limited batches, statistical evidence may not be obtained. Proposed change: 'The manufacturing process is adequate to ensure consistent production (<del>appropriate to the relevant stage of development</del> <u>based on available data depending on the relevant stage of development</u>) ...'.</p> <p>We would suggest that the Term ATIMP is adopted rather than investigational ATMP since this is the term used in all other relevant regulatory documents.</p> <p>This paragraph is extremely unclear because GMP and the risk-based approach for GMP standards should be clearly distinguished from regulatory requirements for marketing or clinical trials authorisations.            Proposed change:            'A Pharmaceutical Quality System should be in place for the entire product life cycle (ICH Q10) and products (ATIMP and marketed ATMP) should be manufactured and released under the auspices of GMP.'</p>
<p><b><u>2. Risk-based approach</u></b>            General:</p>	<p>As discussed above we believe it is important to prevent the confusion and divergence of quality standards both for ATMP as a group of products but also for manufacturers who manufacture both ATMP and other medicinal products.            It is suggested that the term Risk-Based approach is replaced by Quality Risk Management as per ICH Q10 and Eudralex Volume 4. However, it would be useful to add in section 2.1. a specific reference to the existing Guideline on the risk-based approach</p>

Section and Line numbers	Comment and rationale; proposed changes
	<p>according to annex I, part IV of Directive 2001/83/EC applied to advanced therapy medicinal products (EMA/CAT/CPWP/686637/2011).</p> <p>There needs to be a statement that explicitly allows changes to the control strategy based on new information. It is proposed to add a sentence: "New information obtained during development may alter the types of risk and risk levels such that in consideration of this new information changes to the control strategy (e.g. analytical method update, addition or exchange) may be justified."</p> <p>The Pharmaceutical quality system is not examined in detail by pharmaceutical assessors, rather they assess the outputs from the system and the robustness of the data therefrom. It is instead Medicinal Product inspectors who assess the appropriateness of the QMS for the stage of development of the product, as such the application of the QRM principle will need to be justified in internal processes and documentation and be available for inspection. It is suggested the explanation of these paragraphs is expanded to include further explanation of the requirements for GMP verification and documentation compared to that required as part of a dossier submission.</p>
Line 182:	Typographical error 'Matrixes' should be replaced by 'Matrices'.
Lines 238 – 239:	It is not necessarily the case that raw material interaction with starting material would constitute a higher risk. Proposed change: remove the text in brackets or alternatively, provide additional explanation with an example.
Lines 240-241:	<p>The guidance needs to be expanded since qualification of suppliers is only one part of this control strategy. Alternatively, 'i.e. qualification of suppliers' should be changed into 'e.g. qualification of suppliers'</p> <p>"Qualification of suppliers" should be defined and clearly delineated from "Outsourced activities" in Section 13. In particular, the obligation for raw material manufacturers with regards to change control should be delineated from those claimed for contract acceptors in 13.3, lines 2015-2017. As an example, see our proposal hereafter (modifications to 13.3, line 2015-2017 underlined): "<u>The raw material supplier should notify the ATMP manufacturer of any relevant change, affecting safety or specifications of the raw material, in writing, prior to planned implementation for any production or release of any lot made after the change</u>".</p>

Section and Line numbers	Comment and rationale; proposed changes
Lines 229-241:	It is recommended that a sentence referencing Ph.Eur. chapter 5.2.12 on "Raw materials of biological origin for the production of cell-based and gene therapy medicinal products for human use" be included.
Line 244:	The use of the term <i>active substance</i> is often confused by ATMP developers as per our request above we suggest a glossary is added which could provide guidance on this.
Line 246:	Spelling mistake: replace 'immediatly' by 'immediately'.
Line 267:	It is suspected some words have been lost in this sentence, or it should be changed into '...appropriate mitigation measures should be implemented, including information <del>of</del> <u>for</u> the treating physician.'. Please correct as required.
Lines 284 – 292:	<p>The recommendation is not clear. We suspect this paragraph refers to situations of cell-based products for non-homologous use (hence their ATMP status).</p> <p>Proposed change:  The level of qualification /validation should be commensurate with the risk and stage of product development. The quality requirements for Tissues and cells are set out in 2004/23/EC, corresponding commissioning Directives 2006/17/EC and 2006/86/EC and corresponding national legislation of the Member States.</p>
Lines 293 –302:	<p>In general, Annexes 1 and 2 discuss the aseptic requirements in more detail and we believe these documents should remain the core documents for this subject matter. These documents already allow for a risk-based assessment of the stringency for aseptic processing.</p> <p>Additional points:</p> <ul style="list-style-type: none"> <li>• The text needs to clarify that aseptic processing will not be required if the developers are operating a closed system.</li> <li>• The text implies rooms operate to Grade A, this is incorrect, aseptic Grade A zones will be the area within Grade B cleanrooms (this comment relates to a number of entries in the document).</li> </ul>
Lines 303 – 313:	We suggest the topics raised here are better covered by a section on Scope in the introduction.
Lines 315 – 319:	It is suggested that equipment qualification/validation is a more appropriate term than equipment calibration.

Section and Line numbers	Comment and rationale; proposed changes
Lines 314 - 340:	<p>General comment on section 2.3.4. '<i>Additional considerations specifically relevant for investigational ATMPs</i>': As set out in ICH Q10, a risk-based approach is already in place for the manufacture of medicinal products (investigational and marketed products) and it should be commensurate with the predetermined risk for the product and the recipient of the product. As a consequence, with patient/trial subject safety in mind, we do not agree to a general lowering of standards for First-In-Man clinical trial products per se as suggested in lines 322-327; rather, any deviation from Volume 4 requirements should be following risk assessment and appropriately justified.</p> <p>It is important to reinforce that flexibilities would only be permissible if the manufacturing and release strategy requires this to allow supply of the product and that the potential benefits outweigh the risk of this approach.</p>
Lines 328 – 333:	<p>It is important to note that equipment may often be shared between processes in small facilities. It is suggested that such shared equipment might require greater verification and planned preventative maintenance oversight rather than less. This consideration should be included in the guidance.</p>
<p><b><u>3. Personnel</u></b> General:</p>	<p>The text incorporates a lot of Volume 4 requirements; as mentioned above, rather than repeating the text from Volume 4, we suggest an annex discussing specific requirements for ATMPs referring to the appropriate sections in Volume 4 for all other aspects.</p>
Lines 352 – 357:	<p>The text implies that all staff employed in the production of ATMP should be trained in aseptic processes and best practices. This should be amended to explicitly state this is required for staff operating in a cleanroom.</p>
Lines 365 – 366:	<p>It is unclear why there is a need to state training can be in-house since as this is standard practice.</p>
Lines 368 – 369:	<p>It is unclear what is meant by 'Hygiene Programs should be established'. More guidance should be provided.</p>
Lines 411 – 418:	<p>Additional guidance on vaccination would be useful, such as: should all personnel receive Hepatitis B vaccine? The risk to personnel resides not just with the product but with some of the materials used in production. As some personnel handle the materials but not the products, it is important to highlight both risks.</p>

Section and Line numbers	Comment and rationale; proposed changes
	<p>Proposed change:            Add the following words at the end of the last sentence in the paragraph: "Other measures may need to be put in place to protect the personnel according to the known risks of the product <u>and the materials used in its production.</u>"</p>
<p><b>4. Premises</b>            General:</p>	<p>The text incorporates a good portion from EudraLex Volume 4, but omits some critical information. Our suggestion to deal with an annex discussing specific requirements for ATMP such as a sample receipt area for human starting materials etc., would address this issue.</p>
<p>4.2. Production areas</p>	<p>The guideline should take the complexity of ATMPs into account to a greater extent, or provide clarification. Section 4.2 states that the manufacture of ATMPs should take place in a dedicated area of the facility, but this does not account for the fact that ATMPs can be more dissimilar and pose more risks to another ATMP than they do to a different type of product. For example, per the guideline it would be acceptable to make an ATMP that used engineered CHO cells in a device matrix in the same area as an ATMP based on human cells, if they are both classified as ATMPs, but a monoclonal antibody produced in CHO cells would have to be manufactured in a different area.</p>
<p>4.2.1. Design and construction            General:             Line 469 and footnote 4:</p>	<p>There is not a clear description of Air locks and pass through with pressure differentials, interlocks and timing when doors can be open.</p> <p>Depending on local requirements additional exclusion criteria may apply. Consider addition of "Donors that have tested positively for HIV 1 and 2, Hepatitis B, Hepatitis C or Syphilis <u>and any other infection screened as per local requirements</u>".</p>

Section and Line numbers	Comment and rationale; proposed changes
<p>4.2.2 Aseptic environment Lines 506 – 507:</p> <p>Lines 512 – 513:</p> <p>Lines 527 – 530:</p> <p>Lines 605 – 616:</p> <p>Lines 625 – 627:</p>	<p>It is disputed that a Grade D environment is required for a fully closed system. Controlled non classified environment should be sufficient. For example, Blood Services which employ many 100,000s closed system processes each year are not required to operate to grade D conditions. The risk of the process and the design of the isolator may need to be considered before it can be assumed that grade D is acceptable.</p> <p>Proposed change: “Monitoring <u>of isolators</u> should be carried out...” .</p> <p>Particles &gt;5µM are omitted from the text here but are discussed later in the document (Lines 559 -560). If this is not an omission can the rationale for not monitoring nonviable particulates of this size be provided since a rise in these particulates can often indicate a problem with the environment (e.g. may indicate a problem with HVAC)?</p> <p>It would be useful to also provide an example of the specific situation for isolators that can operate in negative or positive pressure differential depending on the activity.</p> <p>It should be added that storage areas such as release vs quarantine, etc. need to be distinct.</p>
<p><b><u>5. Equipment</u></b> Lines 660 – 661:</p>	<p>This sentence does not account for the flexibility allowed in the case of closed systems or isolators where other grades of background areas are permitted (see text on line 506 and following).</p>
<p><b><u>6. Documentation</u></b> General:</p>	<p>It is suggested that more emphasis is provided on the need to maintain traceability and guidance provided to manufacturers on how to meet this obligation.</p>
<p><b><u>6.1 General principles</u></b></p>	<p>It is not clear from this section if the document is referring to key QMS documentation (e.g. contracts) or key GMP documentation. Chapter 4 of volume 4 refers to 2 primary document types involved in GMP operations-instructions and reports.</p>

Section and Line numbers	Comment and rationale; proposed changes
<p data-bbox="203 360 427 419"><u>6.2. Specifications and instructions</u></p> <p data-bbox="203 632 315 655">Line 738:</p> <p data-bbox="203 699 405 722">Lines 765 – 766:</p>	<p data-bbox="488 360 2040 587">Reference is made to the potential for non-substantial and substantial amendments (modifications) to be filed to the IMPD. However, the Regulation quoted does not provide guidance on what would be considered substantial and non-substantial for ATMPs. Since we know that the list of substantial amendments in the EMA guideline for biological products for clinical use (EMA/CHMP/BWP/534898/2008) is different from that in the EMA guideline for APIs (CHMP/QWP/185401/2004), it would follow that the list could be different again for ATMPs. Without that guidance, Competent Authorities are likely to have different expectations for modifications requiring prior approval. Industry should encourage the development of this list in parallel to this GMPs guidance, or the sections on amendments will be hard to apply in the context of ATMPs.</p> <p data-bbox="488 632 1503 655">Additional guidance on how to assess the criticality of raw material would be useful.</p> <p data-bbox="488 699 1939 758">The batch definition should also mention directed allogeneic batch. Proposed change: "For autologous <u>and directed allogeneic products</u>, each unit should be considered as a distinct batch".</p>
<p data-bbox="203 818 360 847"><u>6.3. Records</u></p> <p data-bbox="203 855 315 879">Line 838:</p>	<p data-bbox="488 855 2074 946">It is implied here and later in the document that an examination of the stability of the product is only required for marketed ATMP. This is incorrect, moreover this is common mistake made by academic developers of ATMP. This guidance must detail that the stability of ATIMP should be examined and should recommend this testing be built into the early development path for the product.</p>
<p data-bbox="203 1010 383 1070"><u>6.4. Other documentation</u></p> <p data-bbox="203 1078 394 1102">Lines 841- 855:</p>	<p data-bbox="488 1042 2063 1102">A number of key documents required for compliance with ICH Q10 which are included in Volume 4 are omitted from the list of key records/reports. e.g.</p> <ul data-bbox="533 1110 965 1283" style="list-style-type: none"> <li>• Change controls</li> <li>• Validation of systems/processes</li> <li>• Audits</li> <li>• Complaints</li> <li>• Product defects</li> </ul>

Section and Line numbers	Comment and rationale; proposed changes
<p><u>6.5. Retention of documents</u> General:</p>	<p>Retention of Documents should include an acknowledgement that some ATMPs will have documentation storage times specified by other directives and regulations (e.g. tissues and cells directive 2004/23/EC requires data required for traceability to be stored for 30 years). This is acknowledged in the section on Traceability (6.6) but that section is also inconsistent. The guideline should start with the assumption that the manufacturer of an ATMP that uses materials subject to the requirements of 2004/23/EC, and subsequent directives, should plan to retain donor identification codes, batch records and information on critical raw materials and active substances for 30 years. The information in the guideline on batch record retention (line 870) is contradicted by the instructions on retention of the batch record for traceability (line 889) and this should be clarified in the text.</p>
<p><u>6.6. Traceability</u> Lines 885 – 888:</p>	<p>Whilst the text is correct in quoting what the Regulation states, it is suggested the guidance should be broadened to explain the requirement for the retention of data only on raw materials which could potentially affect the <u>quality and /or safety</u> of the product.</p>
<p>Lines 910 – 911:</p>	<p>The use of the term donor is incorrect in relation to xenogeneic cells. Proposed change: change 'donor' into 'source'.</p>
<p><b><u>7. Starting and raw materials</u></b> <u>7.2. Raw materials</u> General:</p>	<p>The section should clarify that the products need to be assessed for suitability to ensure they are fit for the intended purpose. The fact that raw materials that are approved for use as medicinal products themselves do not require CoAs (Section 7.2) is helpful, but it is not clear if the products need to be approved in the EU for this to apply, or if a material approved anywhere meets this requirement. There is an implication that some proof of approval or other reference to the quality of the material will be provided in order to justify the omission of the CoA, but the guideline does not explicitly state what should be provided. This should be clarified.</p>
<p>Lines 926 – 929:</p>	<p>The use of antibiotics may interfere with sterility testing but other types of interference are also possible (e.g. depending on the mechanism of action).</p>

Section and Line numbers	Comment and rationale; proposed changes
<p>Lines 936 – 937:</p> <p>Lines 940 – 942:</p>	<p>Proposed change: “While raw materials should be of pharmaceutical grade <u>or other grades with documented adherence to relevant GMP principles and safety standards</u>, it is acknowledged ...”.</p> <p>In addition, it is suggested that reference is made here to Quality Risk Management principles.</p> <p>The following rewording is proposed:  “Additionally, the ATMP manufacturer should ensure the suitability of such raw materials for the intended use, including, where appropriate, by means of testing (e.g. functional <u>and/or safety</u> test)”.</p>
<p><u>7.3 Starting materials</u>  General:</p> <p>Lines 952 -959:</p> <p>Line 982:</p> <p>Lines 1036 – 1042:</p>	<p>The definition of starting material/critical raw material/active substance is often confused by developers and regulators, for example in the case of viral vectors (e.g. how are plasmids used in the production of viral vectors defined when used in a Gene Therapy Product or when used to transduce a genetically modified cells leading to a CBMP?) Such specific guidance could be provided in this guidance document and then incorporated into Volume 2 of the Notice to Applicant.</p> <p>This paragraph suggests that provided an adequate risk-analysis is made, reliance on the supplier’s certificate of analysis can be done and no further testing be carried out by the ATMP manufacturer. This is misleading because, as a minimum and irrespective of the risk analysis, an identity test must be carried out.</p> <p>Reference should also be made to the Blood Directive 2002/98/EC.</p> <p>ARM understands that the Tissues and Cells and Blood Directives have not been uniformly transposed into member state law and that there are different interpretations and enforcement with regard to the activities over Donation, Procurement, Testing and Release for materials used as Starting Materials. Requirements about testing and respective responsibilities provided in this guidance may potentially be contradictory to that in national member state law.</p>

<p><b><u>8. Seed lot and cell bank system</u></b></p> <p>General:</p> <p>Line 1072</p> <p>Lines 1117 - 1119</p> <p>Lines 1126 - 1129</p>	<p>ARM recommends this document should provide more structured guidance relevant to developers related to the QC testing requirements such as identity testing, minimal viral risk testing algorithms, etc. and comparability requirements following batch replacement.</p> <p>Proposed change: "However, the establishment of seed lots/cell banks is not mandatory <u>or may not be appropriate</u>".</p> <p>The term "cell stock changes" should include introduction of new cell bank(s) obtained from new donors. Proposed change: "Cell stock changes <u>and introduction of new cell banks(s) derived from new donors</u> (<del>including introduction of cells from new donors</del>) should be addressed in the marketing authorisation and the conditions therein should be complied with."</p> <p>The following rewording is proposed: "In these cases, a risk analysis should be conducted to identify <u>any gaps in the information that would be required to meet current GMP standards, for example donor consent, donor testing etc., and to detail mitigation to any identified areas where this is reduced or missing information</u> <del>the testing requirements necessary to ensure the quality of the starting material</del>".</p>
<p><b><u>9. Production</u></b></p> <p>General:</p> <p>Lines 1161, 1177, 1423, 1428:</p>	<p>This section incorporates once more some but not all of Volume 4; we suggest an annex discussing specifics of the production of ATMP would be more helpful.</p> <p>Quality Control is used incorrectly here and in the remainder of the document; this should be replaced by Quality Assurance unless the text is specifically related to testing of quality parameters.</p>
<p><b><u>9.1. General principles</u></b></p> <p>Lines 1159-1162:</p>	<p>Proposed change: "Any deviation from instructions or procedures should be avoided as far as possible. If a deviation occurs, it should be <u>fully investigated and assessed for the potential impact on product and environment and if appropriate</u>, approved in writing by the person responsible for manufacturing, with the involvement of the person/department responsible for quality control."</p>

<p><u>9.3. Utilities</u> 9.3.1. Water</p> <p>9.3.3. Clean Steam</p>	<p>This production of pharmaceutical grade water is a high risk activity and we would suggest that more guidance is required for users who are less familiar with or who have no knowledge of the production, testing and maintenance of this utility. The paragraph needs to be expanded greatly and provide concise advice (e.g., the water system in its entirety should be fit for purpose rather guidance be limited to the pipes). Therefore, this statement should include tanks, sample points etc. with reference to relevant documents such as relevant EP monographs.</p> <p>This is a high risk activity and we would suggest that more guidance is required for users who are unfamiliar with the use of this utility.</p>
<p><u>9.4. Prevention of cross-contamination in production</u> General:</p> <p>Lines 1242 – 1246:</p>	<p>It is suggested that the need for appropriate line clearance (product and labelling) is included in this section of the guidance. In addition, the highest risk to product contamination is personnel based. We suggest more guidance is provided for personnel moving between areas within the same facility.</p> <p>Cleaning would be required between batches irrespective of whether the product was autologous or allogeneic. We propose to remove the words 'For autologous products'.</p>
<p><u>9.5. Aseptic manufacturing</u> General:</p>	<p>It is suggested this section lacks the level of details of annexes 1 and 2 in Volume 4 and should be expanded.</p> <p>For manual aseptic manufacturing processes where every patient dose is tested for sterility as part of lot release, is the conventional concept of aseptic validation appropriate/required?</p> <p>EP Monographs 2.6.1 (Sterility) and 2.6.27 (Microbial Examination of cell-based Preparations) should be referenced and details provided on the appropriate use of these monographs.</p>

	<p>Process Simulation Tests (PST): For some products, sterility test results for each individual produced dose, will be available at lot release and the material will have already been used by the patient; while an investigation can be conducted, product impact will already have been established during lot release.</p> <p>For manual aseptic processes, it is important to ensure that every operator is qualified to perform all aseptic operations successfully; in addition to confirming that the process itself (process, materials, facility, personnel combined) can be validated for aseptic performance. The requirement to include "each shift" could also be met by having operators perform 3 consecutive qualification exercises (process simulations) on selected aseptic operations.</p> <p>Is it possible to consider aseptic control strategies that include an aseptic operator qualification program incorporating process simulations, environmental and personnel monitoring, and sterility testing of each individual patient dose, in lieu of mandatory time-based media fills? Failure of control strategies would trigger media fills, if warranted.</p>
Lines 1267 – 1274:	<p>A closed system normally related to the manufacturing processing plastic ware and equipment rather than containment equipment such as isolators and as such the use of the phrase may be confusing in this context. Guidance should also be provided for the use of MSC which are often used rather than isolators in processing of ATMP.</p>
Lines 1283 – 1289:	<p>This paragraph should be expanded to provide more detailed guidance.</p>
Lines 1332 – 1336:	<p>For manual aseptic manufacturing processes where every patient dose is tested for sterility as part of lot release, is the conventional concept of aseptic validation appropriate/required?</p>
Lines 1339 – 1345:	<p>It is important that a Process Simulation Test (PST) should include known possible interventions and possible worst case situations; we suggest such detailed guidance, as provided in Volume 4, is provided by this guidance. See also general comment above.</p>
Line 1355:	<p>Process simulation test is a media fill. We would propose that "<i>with media fill test</i>" is removed.</p>
Lines 1365 – 1367:	<p>We would suggest that the process simulation test process and frequency should be stated to be based on risk, irrespective of the intended use of the product.</p>

<p><u>9.7. Packaging</u> General:</p> <p>Lines 1395 - 1396:</p>	<p>It is requested this document produces more guidance on the specifics of labelling of ATMP (e.g. labelling of product for storage at ultralow temperatures, small package sizes, the provision of an aseptic primary container etc.).</p> <p>The requirements for primary packaging for ATMPs appear more stringent than those for conventional products, specifically the requirement for “approval and maintenance” of the suppliers of these materials. The wording suggests that the suppliers of primary packaging for ATMPs are subject to a degree of scrutiny greater than suppliers of packaging for conventional products. Since suppliers may not be prepared to undergo additional scrutiny for clients seeking to register low volume products this requirement has the potential to adversely affect ATMP manufacturers.</p> <p>The reference to validation of the closure is unclear. Is the reference to the performance of container closure integrity testing, or is there an expectation that a specific torqueing process will be used and validated?</p>
<p><u>9.9. Rejected, recovered and returned materials</u> Lines 1416 – 1418:</p>	<p>This sentence is too vague, since the word "contemplated" is not definitive. Proposed change: “For authorised ATMPs, reprocessing is only permissible if <u>the reprocessing procedure is described in the Marketing Authorisation, the specific conditions under which it would be performed are defined, and data are presented to support it</u>”.</p>
<p><b><u>10. Qualification and validation</u></b> General:</p>	<p>This section lacks a lot of details, for instance with regard to operation and at rest parameters. Reference should be made to the details contained in Volume 4.</p> <p>In several places (Section 2.3.4, line 239; Section 10.2, line 1548) the guideline makes the assumption that when few batches are made, a less stringent approach to GMP can be taken. It would be helpful if the guideline could provide more information on how that conclusion has been reached. Issues with equipment calibration will be much harder to detect when very small numbers of batches are manufactured, since no trending can be performed, and specialized equipment could be stored for long periods without use. A pragmatic approach would be to propose an ad-hoc calibration program for very low volume products.</p>

Line 1459:	As per earlier comment, Cleanrooms are Grade B, but may contain Grade A zones. Proposed change: replace 'clean room of grade A' into 'Grade A zones'.
Lines 1486 – 1489:	It is suggested that what is proposed may introduce unnecessary risk. Can the Commission provide examples of when such concurrent validation could be justified if surrogate material is to be used for validation?
Lines 1494 – 1498:	This lacks the detail and the instruction that validation should be prospective and that protocols should be written and approved by the appropriate personnel in advance, as we believe this guidance is required for inexperienced developers.
<u>10.2. Cleaning validation</u>	
Lines 1546 – 1550:	The cleaning verification requirements for investigational products are unclear, since they depend on the volume of production. If the volume of production is small (less than 3 batches) then verification alone is considered sufficient. Cleaning verification, as opposed to cleaning validation, is not defined in the guideline. In addition, no context is provided for the production volume (is this less than 3 batches a year, a campaign, ever, etc.?) It is unclear how the number of batches of the ATMP affects the extent to which those batches could be contaminated with another product, since for low volume products the previous batch is more likely to be a different product, and hence the risk of cross-product contamination greater on a batch to batch basis.
Line 1535:	Proposed change: "Validated analytical methods <u>that should be sufficiently sensitive to detect residue levels.</u> "
Lines 1564 - 1574:	The list does not include all of the parameters required by Annex 15; for clear guidance this section should be expanded in line with this annex.
<b><u>10.3 Process validation</u></b>	
General:	The flexibility introduced in this section is welcomed and this guidance meets requirements for inexperienced developers; however, it is unclear if the sections included from line 1587 are definitions or if these processes are permissible for ATMP. If this is the case then we suggest more guidance on when these are applicable are required especially for circumstances such as concurrent validation which is generally unacceptable to CA, in particular if surrogate material is being used in this concurrent validation.
Lines 1602:	Spelling mistake: change 'ration' into 'ratio'

Line 1623:	Proposed change: "Additionally, it is expected <u>however</u> that the aseptic conditions of the manufacturing process have been validated."
<b><u>11. Qualified person and batch release</u></b>	
Lines 1658 -1663:	It is proposed to expand this paragraph to include reference to Blood Directive and the Tissue and Cell Directive. Proposed change: add the following sentence " <u>The QP should also understand and take into account the requirements of the Blood Directive (2002/98/EC) and the Tissue and cell directive (2004/23/EC)</u> ".
Lines 1667 – 1668:	This should state EU GMP.
Line 1676:	A clear definition of the active substance should be provided.
<b><u>11.3. Batch release</u></b>	
General:	Clarity should be provided on what relates to batch release or batch certification.
Lines 1782 – 1785:	It is suggested that the qualification and training of this person needs to be discussed and advice provided. Furthermore, it is very difficult to understand how a QP will be able to justify a decision made by the designated person if they themselves were not involved in that decision making process. As such we believe a 2 stage certification should be performed by a QP. If, however these 2 stages are to be performed by 2 different individuals, then there needs to be a technical agreement between the individuals as there currently is between QPs.
<b><u>11.4. Handling of unplanned deviations</u></b>	
	The discretion proposed in case of unplanned deviation is not permissible according to current legislation: Directives 2001/83/EC and 2001/20/EC, Volume 4 Annex 13 and Annex 16 requires the QP to certify against registered procedures with no discretion by the QP. A change to the legislation is required to effect this. As such this clause must be removed until the legislation is revised.
<b><u>12. Quality control</u></b>	
General:	The functions of QA and QC are becoming confused, they should be disentangled and explained fully.
Lines 1853 – 1927:	More guidance on the aspects of sampling that are specific for ATMPs would be very helpful.

Lines 1911- 1916:	It is suggested this text is reviewed; for example, an ATMP could have a shelf-life of 10 days where as a classic pharmaceutical have a shelf-life of 3 years. It is suggested that this retention period should be risk-based and based on the product characteristics rather than a direct translation form the current volume 4 as per the flexibility detailed below.
Lines 1919 – 1927:	Guidance should be provided on the usefulness of samples retained in other media such as formaldehyde or wax embedded sections for products such as Tissue Engineered Products.
Lines 1958 – 1960:	It is unclear why technical transfer of testing methods is called out here whereas technical transfer of processing methods is not discussed. It is suggested that technical transfer in its entirety should be covered in a separate section.
Lines 1971 - 1989:	The section 12.4. 'Stability monitoring programme' states that the stability programme should be implemented after the MAA is granted (line 1972), but the stability programme should be established prior to the MAA, so that the stability protocol becomes part of the regulatory commitment. Stability data should be generated pre-approval, ideally on lots used in the clinic, and studies should be presented to support the proposed shelf-life.
<b><u>13. Outsourced activities</u></b> General:	"Qualification of suppliers" should be defined and clearly delineated from "outsourced activities" (13.). In particular, the obligation for raw material manufacturers with regards to change control should be delineated from those claimed for contract acceptors in 13.3, line 2015-2017. As an example, the following change is proposed on lines 2015-2017: " <u>The raw material supplier should notify the ATMP manufacturer of any relevant change, affecting safety or specifications of the raw material, in writing, prior to planned implementation for any production or release of any lot made after the change</u> ".
<b><u>14. Quality defects and product recalls</u></b> General:	This section should be expanded to cover the different aspects covered in EudraLex Volume 4, Chapter 8, such as handling of product recalled, notification to competent authorities, etc.
Lines 2050 – 2051:	The destruction of a defective product at the clinical site may require consent of the donor.

**15. Environmental control measures for ATMPs containing or consisting of GMO's**

General:

It is suggested, in order to provide GMP guidance, this section should focus on facility control measures rather on environmental measures.  
In general, more guidance on the specifics for the manufacture, testing and stability studies for Gene Therapy and Tissue-Engineered products should be provided in this document.

**16. Reconstitution of product after batch release**

General:

Guidance should be provided on the handover of responsibility between the manufacturer of the ATMP and the administration site taking on responsibility for the preparation steps. The guidance should specifically state the preparation must be in compliance with that included in the MAA or CTA and instructions provided by the manufacturer to the administration site. Additionally, it should clearly refer to best practices for preparation and administration of drug products.  
The document should detail that all relevant equipment used at the clinical site must be appropriately validated and maintained.

It is suggested the term 'Reconstitution' is replaced by 'Preparation' because this will be clearer and avoid confusion (e.g. it is debatable whether cell recovery after cryo-storage fits with the name 'reconstitution').

Whilst cell recovery after cryo-storage is often required for ATMP products because of their unique characteristics, these steps may constitute a considerable risk, requiring more specific guidance in this document.

Line 2096:

It could be specified that the combination of the ATMP with delivery systems, surgical devices, etc., should not result in a product meeting the definition of combined product.

**17. Automated production of ATMPs**

General:

This section raises many complex regulatory and legislative issues and needs to be significantly expanded to be of use to the community.

	In addition, some minor improvements of the current text are proposed, such as:
Line 2184:	Replace 'actors' by 'personnel'.
Lines 2186 – 2190:	Replace by: 'Possibilities for in-process and release controls <del>are</del> <u>may be</u> limited <del>due to the</del> <u>by, for example,</u> continuous closed processing, limited amount of material, <del>and usually</del> <u>or</u> a very short shelf life. <u>In such cases,</u> continuous monitoring of critical process parameters and other input variables that affect product quality (as identified in the marketing authorization/clinical trial authorization) should be performed if technically possible. <u>However,</u> when continuous monitoring is not technically possible...'
Line 2103:	Replace by: 'Lack of routine controls ( <u>e.g.</u> due to continuous process...)'.

### **ARM Members List:**

4D Molecular Therapeutics - AABB - Abeona Therapeutics - Accelerated Biosciences - AGTC - Akron Biotechnology, LLC - Aldevron - Alliqua BioMedical - AlloSource - Alpha-1 Foundation - Amarantus BioScience - American Association for Dental Research - American Association of Tissue Banks - American Society of Plastic Surgeons - Anagenesis Biotechnologies - Andalusian Initiative for Advanced Therapies - Angiocrine Biosciences - AOF Ptc, Ltd - Argos Therapeutics - Asclepius Labs Inc - ASGCT - Asset Management Company - Association of Clinical Research Organizations - Asterias Biotherapeutics - Athersys, Inc. - Audentes Therapeutics - Avalanche Biotechnologies - Avectas - AveXis Therapeutics - Avita Medical - AVROBIO inc - Axiogenesis AG - AxoGen, Inc. - Bamboo Therapeutics - Baxalta (Shire) - Baylor College of Medicine, Center for Cell and Gene Therapy Bellicum Pharmaceuticals, Inc - Benitec BioPharma - BioBridge Global - BioCardia - BioCision - Biogen - BioLife Solutions, Inc.- Biomatrix - Biostage Inc - Blood Centers of America - bluebird bio - Bone Therapeutics - BrainStorm Cell Therapeutics - Brammer Bio - Caladrius Biosciences, Inc. - California Institute for Regenerative Medicine Californians 4 Cures - Calimmune, Inc. - Capricor Therapeutics, Inc. - Celgene Corporation - Cell and Gene Therapy Catapult - Cell Medica - Cell Therapies Ltd. - Collect Bio - Collectis - CellGenix GmbH - Cellixir - CellProthera - Cellular Dynamics International, a Fujifilm Company Cellular Technology Limited - Celsense Inc. - Celyad - Centre for Commercialization of Regenerative Medicine Cesca Therapeutics Chemelot Campus B.V. - Cleveland Clinic - Cleveland Cord Blood Center - Coalition for Clinical Trials Awareness - Cognate BioServices - CombiGene AB - Commence - Bio (Wibi+Works Therapeutics) - Cord Blood Registry (AMAG Pharmaceuticals) - Cornell University - CRC for Cell Therapy Manufacturing - Cryoport Systems - CTI Clinical Trial and Consulting Services - CWRU-NCRM - Cytuse Biomedical - Cynata Therapeutics Inc. - CytoVac - Dimension Therapeutics - DiscGenics, Inc. - Dohmen Life Science Services - Editas Medicine - Embody LLC - EMD Serono - Emendo Bio - ESGCT - EveryLife Foundation for Rare Diseases - Evidera - Fate Therapeutics - Fibrocell Science - Fight Colorectal Cancer Research Center - Fondazione Telethon (San Raffaele-Telethon Institute for Gene Therapy) Foundation for Biomedical Research and Innovation - Fraunhofer Institute for Cell Therapy and Immunology - Fred Hutchison Cancer Research Center - Frequency Therapeutics - GE Healthcare - Gemstone Biotherapeutics LLC - GenSight Biologics - GenVec - GlaxoSmithKline - Global BioTherapeutics - Global Genes - GreenCross LabCell - Gri-Cel, S.A.- Haack & Associates - Healios K.K. - HemoGenix, Inc - Hemostemix - Histogenics - Holostem - Human Organ Project, Inc. - Huntington Medical Research Institutes - Immusoft - Institut Clayton de la Recherche - Intellia Therapeutics - International Society for Stem Cell Research - Invetech - InVivo Therapeutics - Irvine Scientific - jCyte - JETRO NY - Johns Hopkins University - Johnson & Johnson (Janssen R&D) - Juno Therapeutics - Juventas Therapeutics - Kawasaki Heavy Industries - KeyBiologics - Kiadis Pharma - Kite Pharma - Lake Street Capital Markets - LogicBio - Longeveron - Lonza Group Ltd. - Lysogene - MaSTherCell - MaxCyte, Inc. - Medipost America - Medpace - Memorial Sloan-Kettering Cancer Center - Mesoblast Limited - Michael J. Fox Foundation - MilliporeSigma / EMD Millipore Corporation - MiMedx Group, Inc. - Missouri Cures - MolMed - Musculoskeletal Transplant Foundation - National Disease Research Interchange - National Multiple Sclerosis Society - National Stem Cell Foundation - Nebraska Coalition for Lifesaving Cures - Neural Stem Cell Institute - Neuralstem - New York Stem Cell Foundation - NMDP/Be The Match Bio Therapies - Nohla Therapeutics - Northwest Biotherapeutics, Inc. - Northwestern University Comprehensive Transplant Center - Novadip Biosciences - NovaHep AB - Novartis - Novitas Capital - NuTech - Ocata Therapeutics (formerly ACT) - Opexa Therapeutics - Orchard Therapeutics - Organogenesis Inc. - Organovo Holdings, Inc. - Orgenesis - Orig3n Inc. - Orthocell Pty Ltd. - Osiris Therapeutics - Oxford BioMedica - PCT, A Caladrius Company - Periphagen - Pfizer Inc. - PharmaCell B.V. - Pluristem Therapeutics Inc. - Precision Biosciences - Prevent Cancer Foundation - Promethera

Biosciences SA - ProteoThera, Inc. - Proteus Venture Partners - Regencor - ReGenesys B.V. B.A. - Regeneus Ltd. - REGENXBIO - REMEDI – National Centre for Biomedical Engineering Science, National University of Ireland - ReNeuron Group plc - RepliCel Life Sciences, Inc. - Rocket Pharma - Rooster Bio - Roslin Cell Therapies - RxGen - Sanford Burnham Prebys Medical Discovery Institute - Sanford Health - Sanford Stem Cell Clinical Center - Sangamo BioSciences - Scinogy Pty. Ltd. - SCM LifeScience - Scottish National Blood Transfusion Service - StemBioSys - Stop ALD Foundation - Student Society for Stem Cell Research - Synpromics - Taiwan Bio Therapeutics - TC BioPharm - TERMIS-Americas - Terumo BCT - Texas Cures Education Foundation - Texas Heart Institute - Thermo Fisher Scientific - Thrive Bioscience, Inc. - TiGenix NV – Tissue Gene, Inc. - Toucan Capital - TrakCel Ltd. - Trizell (formerly FinVector) - TxCell - uniQure - Unite 2 Fight Paralysis - United Spinal Association of Virginia.

\*\*\*