Valeria Vistoso

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Welcome! I'm a Materials Science PhD at CNRS in Strasbourg (EU GAP project). I explore volumetric electron microscopy to study bone defects. Materials engineer from Polimi, passionate about research.

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Core business

PHASE 2 **Skill development**

During my PhD within the Marie Sk?odowska-Curie GAP programme, I combined scientific research with professional development focused on industry-relevant skills. I designed and optimised imaging protocols transferable to industrial R&D, managed complex projects across international teams, and followed training in innovation, intellectual property, and entrepreneurship. Presenting at conferences and engaging with cross-sector partners expanded my professional network. Regular mentoring helped me set clear objectives and identify opportunities to apply my expertise beyond academia.

PHASE 1 **Evaluation**

Throughout my PhD, I regularly assessed the quality and relevance of complex datasets, including 3D imaging and morphometric analyses of bone microarchitecture. I critically reviewed experimental protocols, optimised workflows, and evaluated the reproducibility of results to ensure high standards. Presenting my research at international conferences and publishing peer-reviewed articles helped me refine my ability to communicate findings and incorporate constructive feedback. I also served as a reviewer for the journal JOM, developing objective and balanced evaluations of scientific contributions.

PHASE 2 **Information management**

During my PhD, I conducted extensive literature reviews to map the state of the art in bone imaging and multiscale analysis, using bibliographic and patent databases. I designed data management workflows to organise large 3D imaging datasets, ensuring traceability, reproducibility, and long-term accessibility. I routinely assessed the reliability and relevance of scientific publications, technical reports, and experimental data. Collaborating with IT specialists and data managers allowed me to implement effective solutions for storage, backup, and data sharing across international research teams.

PHASE 2 **Expertise and methods**

My PhD research focused on developing and applying advanced volumetric electron microscopy (ATUM-SEM, FIB-SEM) and synchrotron tomography methods to study bone microarchitecture. I designed experimental protocols, selected appropriate techniques, and critically assessed alternative approaches to optimise imaging workflows. Collaborating with specialists in biomechanics and materials science helped me explore related fields and integrate complementary techniques. I documented workflows and analysed results using quantitative metrics. Presenting my work at conferences improved my ability to adapt arguments to different audiences. I also shared practical advice on imaging protocols with colleagues to support effective use of methods.

Personal and relational qualities

PHASE 2 **Communication**

During my PhD, I communicated complex scientific results to diverse audiences, including specialists at international conferences and non-experts through outreach activities. I prepared persuasive presentations and adapted my language to different contexts, from peer-reviewed publications to interdisciplinary meetings. As an Italian native speaker who works daily in English and French, I have developed the ability to communicate effectively in multilingual environments. Managing my professional online identity and sharing research updates also strengthened my digital communication skills.

PHASE 1 **Collaboration**

During my PhD, I built collaborative networks through the Marie Sk?odowska-Curie GAP programme, engaging with researchers from multiple European institutions. Working on shared projects and co-authoring publications taught me to assess the benefits and constraints of partnerships. Regular exchanges with experts in biomechanics and materials science helped me broaden my perspective and identify common objectives. Participating in international conferences and workshops also helped develop a professional network beyond my core discipline.

PHASE 2 **Analysis, synthesis and critical thinking**

During my PhD, I applied critical thinking to adapt volumetric electron microscopy workflows to mineralised bone, challenging established protocols and proposing improvements. I combined insights from materials science and biomechanics to challenge conventional approaches and develop innovative solutions. Evaluating complex datasets requires independent analysis and synthesis to extract meaningful conclusions. Sharing my findings in international forums and discussing them with peers helped me refine my perspectives and adopt alternative analytical methods relevant to emerging research questions.

PHASE 2 **Open-mindedness and creativity**

During my PhD, I combined concepts from materials science, biomechanics, and imaging to design innovative workflows for analysing bone microstructure. Working in an international environment challenged me to adopt new perspectives and explore alternative approaches beyond my initial expertise. Developing protocols for volumetric electron microscopy required creativity to overcome technical limitations. Engaging with researchers from different disciplines and cultures helped me broaden my vision and integrate diverse ideas into my project.

PHASE 2 **Commitment**

Throughout my PhD, I maintained a strong commitment and motivation while developing innovative imaging protocols in a complex, interdisciplinary context. Moving between materials science, biomechanics, and microscopy required perseverance and adaptability. Working in an international research environment helped me apply this dedication across different cultures and areas of expertise. I supported colleagues by sharing resources and encouraging collaborative problem-solving, contributing to a positive and engaged working atmosphere even when facing technical or experimental challenges.

PHASE 2 **Integrity**

During my PhD, I ensured that all experimental data and publications respected ethical standards, confidentiality agreements, and intellectual property regulations. I was responsible for managing sensitive research data and for declaring potential conflicts of interest when collaborating with partners. Serving as a peer reviewer for JOM reinforced my commitment to integrity and transparency in evaluating others' work. I consistently honoured my commitments and maintained coherence between objectives, actions, and communication in collaborative projects.

PHASE 2 **Balance**

Throughout my PhD, I learned to manage the pressure of demanding research activities and long experimental timelines while maintaining a healthy balance between my personal life and academic pursuits. Facing unexpected technical challenges required resilience and the ability to stay focused without compromising well-being. I developed strategies to separate work and personal time, prioritise tasks effectively, and remain constructive even when dealing with setbacks or strong opposition. These experiences strengthened my capacity to draw on my strengths and maintain perspective in stressful situations.

PHASE 2 **Listening and empathy**

During my PhD, I worked in multidisciplinary teams where active listening and understanding different perspectives were essential. Regular discussions with colleagues from diverse backgrounds helped me appreciate their needs and expectations. I made a point of acknowledging their contributions and expressing gratitude for shared efforts. When facing experimental challenges, I supported peers by offering advice and encouragement, which helped build a constructive and respectful working atmosphere.

Business management and value creation

PHASE 2 **Project management**

During my PhD, I managed complex experimental workflows that combined synchrotron tomography and electron microscopy. I planned schedules, prioritised tasks, and adjusted objectives when unexpected challenges arose, such as technical failures or delays in data acquisition. Coordinating with international partners required clear communication of expectations and timelines. By monitoring progress and identifying gaps early, I ensured the successful completion of milestones and delivery of results within tight deadlines. These experiences strengthened my ability to manage demanding projects autonomously.

PHASE 2 **Managing change**

During my PhD, I led the introduction of new preparation protocols for volumetric electron microscopy on mineralised bone, replacing established methods. To secure acceptance, I demonstrated early positive results and shared evidence of improved data quality with colleagues. When technical challenges emerged, I analysed potential causes of failure and adapted procedures accordingly. Collaborating with researchers from different backgrounds helped me build support for these changes and maintain momentum in implementing innovative workflows.

PHASE 1 **Managing risks**

Throughout my PhD, I identified and addressed technical and organisational risks associated with complex imaging workflows, including equipment failures, sample preparation issues, and data loss. I implemented preventive measures, including detailed protocols, backup strategies, and contingency plans to minimise disruptions. Collaborating with project partners helped me anticipate potential challenges during experiments and improve overall risk awareness. These experiences strengthened my ability to assess and manage risks inherent in innovative research activities.

PHASE 2 **Decision-making**

During my PhD, I made decisions about experimental priorities, protocol adjustments, and data analysis strategies in a context where resources and time were limited. I learned to weigh the trade-offs between technical optimisation and practical constraints. For example, I sometimes had to prioritise reproducibility over resolution to meet project deadlines. When initial decisions did not yield the expected outcomes, I critically re-evaluated them and implemented alternative approaches. This experience enhanced my confidence in taking responsibility for my choices and adapting when necessary.

PHASE 1 **Producing results**

During my PhD, I transformed innovative imaging approaches into validated protocols for analysing bone microstructure. I iteratively tested and refined preparation and acquisition

methods, learning from each experimental cycle. Publishing peer-reviewed articles and presenting at conferences requires familiarity with research dissemination processes and intellectual property considerations. Collaborating with partners helped me identify the most effective ways to share results and ensure their relevance for both academic and potential industrial applications.

PHASE 1

Intellectual and industrial property

During my PhD, I received training in intellectual property and data confidentiality, learning how to manage sensitive research information appropriately. Preparing publications and presentations required careful consideration of when and how to disclose results. I also gained awareness of the benefits and limitations of patenting research outcomes, as well as the importance of protecting proprietary methods when collaborating with external partners.

Strategy and Leadership

PHASE 1

Strategy

During my PhD, I learned to position my project within the strategic priorities of the Marie Sk?odowska-Curie GAP programme and the broader field of biomaterials research. Collaborating with international institutions made me aware of how different stakeholders and partners contribute to advancing shared objectives. Engaging with project coordinators and senior researchers helped me understand their motivations and the potential impact of my work on collective goals. This experience strengthened my ability to connect individual contributions to wider strategic directions.

PHASE 1

Leadership

During my PhD, I demonstrated leadership by taking the initiative to improve experimental workflows and share best practices with colleagues. I contributed to building trust and constructive relationships within international research teams. By actively supporting others in solving technical issues and coordinating shared activities, I helped create a collaborative environment. These experiences developed my ability to be persuasive, mobilise collective skills, and encourage engagement even without formal authority.