**Professor Chun-Xia Zhao Interview Transcript– BRoll footage**

***Embargoed until 31 July 2025***

**Supporting Media Release: From Cancer Therapeutics to Critical Minerals Recovery**

**How Australian Scientists are Building Game-Changing Technology to**

**Secure the World’s Critical Metals**

* **0.00 - 7.15: Interview with Prof. Chun-Xia Zhao (vision and audio)**
  + **0.00 - 0.31: Introduction**
    - * My name is Chun-Xian Zhao. I'm a professor in the School of Chemical Engineering at the University of Adelaide. I'm the Deputy Director of the A.R.C. Centre of Excellence, ‘C.O.E. Minerals’ (COEMinerals) for short. My background is in bioengineering, nanotechnology, and we developed, like a novel drug delivery and nano medicine for cancer therapy.
  + **0.31 - 1.06: Delving into the science answering: 'From medicine to minerals - how did that happen?'**
    - * A few years ago, we started to discuss the potential of using the technology we developed for cancer therapies to be applied in the field of mineral processing. We met with Professor Kevin Galvin (University of Newcastle) for the application for the A.R.C. (Australian Research Council) Centre of Excellence; and we discussed the idea of how we use techniques in cancer therapy (..) in mineral processing.
  + **1.06 - 1.46: Why do you call peptides the 'DNA' or genetic code of minerals?**
    - * Metals and minerals don't have DNA, but we know each metal and mineral has a particular type of chemical and physical properties. By identifying the peptide binding to particular minerals is like we’re uncovering the code for this particular mineral. So we call them DNA or genetic codes, and these unique sequences are able to bind and separate these minerals.
  + **1.46 -2.42: How does the science work?**
    - * (So) we developed new biomolecules - peptides – for targeting at mineral separations.
      * And so a peptide is just like a short chain of amino acids, and there are 20 naturally existing amino acids. So you can imagine if you mix seven of them together, you will get a million of them a library.
      * Through a screening process, we identify a particular peptide which bonds to the mineral particles and use them for recovery of the mineral from mixed, complex mixtures.
      * (So) we managed to engineer these peptides to be recyclable, so we can use them and release them again under certain conditions and reuse them.
  + **2.42 - 5.12: What does your newly published research tell us about the potential of the peptide approach?**
    - * In this new (research) publication just out, we use silver as the model mineral and separate them from base particles, like silica. We achieved 98% purity with like up to 95% recovery. And we can even like work that even up.
      * In addition to currently we are working to the silver, we are also working on other critical minerals, as well as like rare earths.
      * And so the technology can be applied for wide range of different minerals and metals.
      * So for example, for the rare earth separation ..currently, the existing process requires, for example, hundreds of these solvent extraction steps. We hope to use our technology to reduce this requirement to one or two steps, to really avoid using any toxic solvents or chemicals, and make this process more biocompatible and environmentally friendly. But at same time, high efficiency, high purity as well.
  + **5.12 -5.32: What are the next steps?**
    - * Compared to traditional mineral separation .. because the mineral grade is reducing – there is an urgent need for new technology for this high selectivity, high purity and high recovery. So that's, I think, the unique property or advantage of our technology.
      * There are 20 naturally existing amino acids. You can imagine this as a Lego pieces. You just randomly put these 20 letters together so you get millions of them, and then by choosing, for example, seven or 10 of them as a chain, so you get like a special, unique viral peptide, and we are able to identify a unique peptide which binds specifically to a mineral or particle.
      * So it's like a process you find a key to a lock.
      * So we're currently partnering with an Australia company Theis Metals to really translate this technology to real application, to scale up the process for real mineral processing.
  + **5.32 - 7:11 Why should everyday Australians care about this**
    - * Everyone has a phone. People might have electrical vehicles, and also the wind turbines, they all have this like a rare earth or critical minerals there, which is very critical for clean energy translation, and also for Australia’s economy to grow and national security. And we really want this new technology to play a role in that kind of a clean energy transition and to build environmental friendly - and a more efficient sustainable process for - mineral processing.
      * Currently, what we're doing is basically in the lab, is fundamental discovery, but with the partnership with industry and with the support of the A.R.C. Centre of Excellence funding, we think will that could potentially lead to a revolutionary change. We all know a transformational change doesn't happen overnight. It takes years of hard work, the collaboration with industry partners, but we hope by laying this foundation in the research, and we hope this new technology will benefit our Australian industry as well as the community in the decades to come.
* 7.11- 13.30 BRoll Lab footage with researchers working in the lab with technical equipment, test tubes, etc (no sound/audio)

**Note to Editors**

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**Additional Materials for Media**

* Interview with Prof./ Chun-Xia Zhao and Broll footage: [Prof Chun-Xia Zhao Interview and Broll here](https://vimeo.com/1104332740/1de4816571?share=copy)
* Transcript and [other media materials here](https://www.coeminerals.org.au/outreach/news-materials) (Interview transcript, photos schematics, bios, explainer, social media reel video link to download)

**About COEMinerals**

The ARC Centre of Excellence for Enabling Eco-Efficient Beneficiation of Minerals (COEMinerals) is a national research centre, funded by the Australian Government through the Australian Research Council Centres of Excellence funding scheme. The Centre’s diverse scientific team is addressing key industry and environmental challenges associated with mineral processing. COEMinerals is based at the University of Newcastle and comprises nine Australian universities, industry partners and international collaborators. Learn more at [www.coeminerals.org.au](http://www.coeminerals.org.au)