

## PD Dr. Fotios Alexandros Karakostis

### Research Interests

- Creation and experimental validation of innovative virtual anthropological approaches for reconstructing past behaviors, including the "*Validated Entheses-based Reconstruction of Activity*" (V.E.R.A. 1.0 and V.E.R.A. 2.0) protocols, new 3D geometric morphometric techniques, and musculoskeletal biomechanics modeling.
- Reconstruction of habitual behavior and daily life across geo-chronologically diverse bioarchaeological contexts.
- Research on the evolution of hominin manual dexterity and behavior, based on postcranial skeletal remains.
- Experimental neuro-archaeological research (electroencephalography and electromyography) focusing on the cognitive and biomechanical implications of stone tool use in hominin evolution.

### Publications

#### 2024

- Affinito, S., Eteson, B., Tamayo Caceres, L., Moos, E., **Karakostis, F. A.\*** (2024). Exploring the cognitive underpinnings of early hominin stone tool use through an experimental EEG approach. *Scientific Reports* 14, 26936. DOI: <https://doi.org/10.1038/s41598-024-77452-0>
- Eteson, B., Affinito, S., Moos, E., **Karakostis, F. A.\*** (2024). "How handy was early hominin 'know-how'?" An experimental approach exploring efficient early stone tool use. *American Journal of Biological Anthropology* 185, e25019. DOI: <https://doi.org/10.1002/ajpa.25019>
- Kunze, J., Harvati, K., Hotz, G., **Karakostis, F. A.\*** (2024). Humanlike manual activities in Australopithecus. *Journal of Human Evolution* 196, 103591. DOI : <https://doi.org/10.1016/j.jhevol.2024.103591>
- **Karakostis, F. A.\*** & Jäger, G. (Editors). (2024). *Biocultural Evolution: An Agenda for Integrative Approaches* (Edited Volume). Kerns Verlag, Tübingen.
- **Karakostis, F. A.\*** (2024). "Do humans only do what they are good at?": Distinguishing between daily behaviors and evolved functional adaptations in fossil hominins. In *Biocultural Evolution: An Agenda for Integrative Approaches*. Kerns Verlag, Tübingen, pp. 14-27.
- **Karakostis F.A.** (2024) Protocol for the 'Validated Entheses-based Reconstruction of Activity 2.0' (VERA 2.0) Method: Semi-Automated Measurement of 3D Entheseal Changes. *protocols.io*. <https://dx.doi.org/10.17504/protocols.io.5jyl82z8dl2w/v2>
- Eteson B.E., Affinito S., **Karakostis F.A.\*** (2024) The Mind & Muscles: A Protocol for the Simultaneous Measuring of Cognitive and Muscular Activation During Stone Tool Tasks Using Surface Electromyography and Electroencephalography. *protocols.io*. <https://dx.doi.org/10.17504/protocols.io.36wgqnxbygk5/v1>.

- **Karakostis, F. A.\***, Hotz, G., Harvati, K. Reconstructing the manual activities of a fully documented individual of advanced age. (2024). In *Festschrift für Joachim Wahl*, pp. 180-188. Tübingen University Press, Tübingen, pp. 180-188.
- Ieng J., **Karakostis F.A.**, Wilczak C. (2024) Applying the V.E.R.A. Method to Enteseal of the Humerus: An Assessment of Repeatability and Reproducibility. *International Journal of Osteoarchaeology*, 34(5), e3341. <https://doi.org/10.1002/oa.3341>.
- Siali C., Niinimäki S., Harvati K., **Karakostis F. A.\*** (2024) Reconstructing Patterns of Domestication in Reindeer Using 3D Muscle Attachment Areas. *Archaeol Anthropol Sci* 16, 19. <https://doi.org/10.1007/s12520-023-01910-5>.

## 2023:

- **Karakostis, F. A.\*** & Wallace, I. (2023). Climbing influences enthesal morphology in the humerus of mice: An experimental application of the V.E.R.A. methodology. *American Journal of Biological Anthropology* 181, 130-139.
- Voulgari, M., Anastopoulou, I., **Karakostis, F. A.**, Moraitis, K. (2023). Testing the discrepancy between physical and virtual linear measurements. *Anthropologischer Anzeiger*. DOI: 10.1127/anthranz/2023/1739
- Schmidt, P., Koch, T., Blessing, M., **Karakostis, F. A.**, Harvati, K., Dresely, V., Charrie-Duhaut, A. (2023). Production method of the Königsauë birch tar documents cumulative culture in Neanderthals. *Archaeological and Anthropological Sciences*. DOI: <https://doi.org/10.1007/s12520-023-01789-2>
- Floss, H., Bauer, C., Frick, J. A., Hoyer, C., **Karakostis, F. A.**, Kunze, J., Harvati, K. (2023). On humans and bears – suspected Neanderthal remains at Grottes de la Verpillière I & II in Germolles, Commune de Mellecey, France. In : *Au carrefour des territoires – Derniers Neanderthals et premiers Hommes modernes en Bourgogne méridionale, France*. Kerns Verlag, Tübingen.
- Dunmore, C.J., **Karakostis, F. A.**, van Leeuwen, T., Szu-Ching, L., Profitt, T. (2023). Tool use and the hand. In: *Behavior in our Bones*. Elsevier, Amsterdam.

## 2022:

- **Karakostis, F. A.\*** (2022). Statistical protocol for analyzing 3D muscle attachment sites based on the “Validated Entheses-based Reconstruction of Activity” (V.E.R.A.) approach. *International Journal of Osteoarchaeology* 33, 461-474. DOI: 10.1002/oa.3196.
- Kunze, J. **Karakostis, F. A.\***, Merker, S., Peresani, M., Hotz, G., Turloukis, V., Harvati, K. (2022). Evidence for habitual tool use in early hominins. *PaleoAnthropology* 2022, 2.
- **Karakostis, F. A.\***, Hotz, G.\* (2022). Reflections of manual labor in the hand entheses of early industrial women workers with extensively documented life histories. *American Journal of Biological Anthropology*. DOI: 10.1002/ajpa.24636.
- Bousquié, L., **Karakostis, F. A.\***, Crevecoeur, I., Villotte, S. (2022). Technical note: investigating activity-induced 3d hand enthesal variation in a documented South African sample. *Archaeological and Anthropological Sciences* 14, 213-225.
- Karagiorgou, J., Anastopoulou, I., **Karakostis, F.A.**, Kranioti, E., Moraitis, K.\* (2022). Sexing the sternal rib end in modern Greeks: A virtual osteometric approach using high-resolution 3D surface models. *HOMO - Journal of Comparative Human Biology* 73, 69-76.
- Uhl, A.\*, **Karakostis, F. A.**, Harvati, K. (2022). The application of bony labyrinth methods for forensic affinity estimation. *Biology* 11(7): 1088.

- Göldner, D., **Karakostis, F. A.**, Falcucci, A.\* (2022). Practical and technical aspects for the 3D scanning of lithic artefacts using micro-computed tomography techniques and laser light scanners for subsequent geometric morphometric analysis. Introducing the StyroStone protocol. *PLOS ONE* 17: e0267163.
- Falcucci, A.\*, **Karakostis, F. A.**, Göldner, D., Peresani, M. (2022). Bringing shape into focus: Assessing differences between blades and bladelets and their technological significance in 3D form. *Journal of Archaeological Science Reports* 43: 103490.
- **Karakostis, F. A.\*** (2022). Report on the study of anthropological remains from Evripidi Cave (Salamina island). In: *The cave of Evripidi in Peristeria of Salamina: The Mycenaean stage*. University of Ioannina, Ioannina. pp. 46-65.

#### 2021:

- Castro, A., **Karakostis, F. A.**, Copes, L. E., McClendon, H. E., Trivedi, A. P., Schwartz, N. E., Garland, T. (2021). Effects of selective breeding for voluntary exercise, chronic exercise, and their interaction on muscle attachment site morphology in house mice. *Journal of Anatomy* 240(20 : 279-295. DOI : 10.1111/joa.13547.
- **Karakostis, F. A.\***, Harvati, K. (2021). New horizons in reconstructing past human behavior: Introducing the 'Tübingen University Validated Entheses-based Reconstruction of Activity' method. *Evolutionary Anthropology* 30, 185-198.
- **Karakostis, F. A.**, Hauefle D., Anastopoulou, I., Moraitis, K., Hotz, G., Tourloukis, V., Harvati, K. (2021). Biomechanics of the thumb and the evolution of human dexterity. *Current Biology* 31, 1317-1325.
- Anastopoulou, I., **Karakostis, F. A.\***, Harvati, K., Moraitis, K. (2021). Accurate and semi-automated reassociation of intermixed human skeletal remains recovered from bioarchaeological and forensic contexts. *Scientific Reports* 11, 20273.
- **Karakostis, F. A.\***, Buikstra J., Prevedorou E., Hannigan E.,...Widrick, K. J., Harvati, K. (2021). New insights into the manual activities of individuals from the Phaleron cemetery (Archaic Athens, Greece). *Journal of Archaeological Science* 131, 105415.
- Bothos, E., Ntoumou, E., Kelaidoni, K...**Karakostis, F. A.**, Moulos, P., Karakostis, K. (2021). Clinical pharmacogenomics in action: design, assessment and implementation of a novel pharmacogenetic panel supporting drug selection for diseases of the central nervous system (CNS). *Journal of Translational Medicine* 19, 151.
- Harvati, K., Grün, R., Duval, M., Zhao, J-X, **Karakostis, F. A.**, Tourloukis, V., Gorgoulis, V., Kouloukoussa, M. (2021). Direct U-series dating of the Apidima C human remains. In: *Ancient Connections in Eurasia*. Kerns Verlag, Tübingen. pp. 37-55.

#### 2020:

- **Karakostis, F.A.\***, Reyes-Centeno, H., Francken, M., Hotz, G., Rademaker, K., and Harvati, K. (2020). Bio-cultural evidence of precise manual activities in an Early Holocene individual of the high-altitude Peruvian Andes. *American Journal of Physical Anthropology* 174, 35-48.
- Anastopoulou, I., **Karakostis, F. A.**, M., Moraitis, K. (2020) Regression-based analyses for reassociating human commingled remains of the upper limbs. *Forensic Science International* 315, 110439.
- Uhl, A., **Karakostis, F. A.**, Wahl, J., Harvati, K. (2020). A cross-population study of sexual dimorphism in the bony labyrinth. *Journal of Archaeological and Anthropological Sciences* 12, 1-11.

## 2019:

- Harvati, K., Röding, C., Bosman A., **Karakostis F. A.**, Grün R., Stringer, C. et al. (2019). Apidima Cave fossils provide earliest evidence of *Homo sapiens* in Eurasia. *Nature* 571, 500-504.
- **Karakostis, F. A.\***, Jeffery, N. Harvati, K. (2019). Experimental proof that multivariate patterns among muscle attachments (entheses) can reflect repetitive muscle use. *Scientific Reports* 9, 1-9.
- **Karakostis, F. A.\***, Wallace, I., Konow, I., Harvati, K. (2019). Experimental evidence that physical activity affects the multivariate associations among muscle attachments (entheses). *Journal of Experimental Biology* 222, jeb213058.

## 2018:

- **Karakostis, F. A.**, Hotz, G., Turloukis, V., Harvati, K. (2018). Evidence of precision grasping in Neandertal daily activities. *Science Advances* 4, eaat2369.
- **Karakostis, F. A.\***, Hotz, G., Scherf, H., Wahl, J., Harvati, K. (2018). A geometric morphometric approach to the analysis of hand enthesal three-dimensional form. *American Journal of Physical Anthropology* 166, 246-260.
- **Karakostis, F. A.**, Vlachodimitropoulos, D., Piagkou, M., Scherf, H., Harvati, K. (2018). Is bone elevation in hand muscle attachments associated with biomechanical stress? A histological approach to an anthropological question. *The Anatomical Record* 302, 1093-1103.
- Anastopoulou, I., **Karakostis, F. A.**, M., Moraitis, K. (2018). A reliable regression-based approach for reassociating human skeletal elements of the lower limbs from commingled assemblages. *Journal of Forensic Sciences* 64, 502-506.

## 2017:

- **Karakostis, F. A.\***, Hotz, G., Scherf, H., Wahl, J., Harvati, K. (2017). Occupational manual activity is reflected on the patterns among hand entheses. *American journal of Physical Anthropology* 164, 30-40.
- **Karakostis, F. A.**, Lorenzo, C., Moraitis, K. (2017). Morphometric variation and ray allocation of human proximal hand phalanges. *Anthropologischer Anzeiger*, 74, 269-281.
- Anastopoulou, I., **Karakostis, F. A.**, Borrini, M., Moraitis, K.\* (2017). A statistical method for reassociating human tali and calcanei from a commingled context. *Journal of Forensic Sciences* 63, 381-385.
- **Karakostis, F. A.\***, Velliky, E., Kandel, A. (2017). Sixth annual meeting of the European Society for the Study of Human Evolution. *Evolutionary Anthropology* 26, 7-8.
- Hotz, G., Doppler, S., Gamma, M.-L., Gysin, D., Haas, P., Helmig, G., Huber, L., Kramis, S., **Karakostis, F. A.**, et al. (2017). Theo der Pfeifenraucher: Ein genealogisch-naturwissenschaftliches Identifizierungsprojekt. *Yearbook of the SSGS* 44, 29-61.
- Hotz, G., Doppler, S., Gysin, D., Helmig G., **Karakostis F. A.**, Kramis, S., Lopreno G. P., Roewer, L., Rothe, J., et al. (2017). Theo the pipe-smoker, an interdisciplinary approach. In: *Archaeology and Forensics*. wbg Theiss, Stuttgart. pp. 65-71.

## 2016:

- **Karakostis, F. A.\***, Lorenzo, C. (2016). Morphometric patterns among the 3D surface areas of human hand entheses. *American journal of Physical Anthropology* 160, 694-707.

**2015:**

- **Karakostis, F. A.**, Le Quéré, E., Vanna V., Moraitis, K. (2015). Reconstructing physical activity and sexual distribution of labor in Hellenistic Demetrias, using osteometric data from proximal hand phalanges. *HOMO- Journal of Comparative Human Biology* 67, 110-124.
- **Karakostis, F. A.**, Zorba, E., Moraitis, K. (2015). Sex determination using proximal hand phalanges. *Papers of Anthropology* 24, 37-56.

**2014:**

- **Karakostis, F. A.**, Zorba, E., Moraitis, K. (2014). Osteometric sex determination using proximal foot phalanges from a documented human skeletal collection. *Anthropologischer Anzeiger* 71, 2014, 403-427.

**2013:**

- **Karakostis, F. A.**, Zorba, E., Moraitis, K. (2013). Sexual dimorphism of proximal hand phalanges. *International Journal of Osteoarchaeology* 25, 733-742.