# ESQUEMA TRABAJO INDIVIDUAL

TEMA: Radioterapia guiada biológicamente: fundamentos y perspectivas futuras

ÍNDICE:

1. **Introducción**: concepto general de radioterapia y la necesidad de una evolución hacia enfoques más personalizados. Se contextualiza la radioterapia guiada biológicamente (BRT, Biologically Guided Radiotherapy) en el marco del avance de la oncología de precisión.

Bibliografía:

Bentzen S. M. (2005). Theragnostic imaging for radiation oncology: dose-painting by numbers. *The Lancet. Oncology*, *6*(2), 112–117. https://doi.org/10.1016/S1470-2045(05)01737-7

Baumann, M., Krause, M., Overgaard, J., Debus, J., Bentzen, S. M., Daartz, J., Richter, C., Zips, D., & Bortfeld, T. (2016). Radiation oncology in the era of precision medicine. *Nature reviews. Cancer*, *16*(4), 234–249. https://doi.org/10.1038/nrc.2016.18

   Se podría hablar sobre la radiobiología tumoral considerando la heterogeneidad del microambiente (variabilidad biológica intratumoral: hipoxia, proliferación, densidad celular, angiogénesis). Destacar cómo estas variables influyen en la eficacia del tratamiento.

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Beckers, C., Pruschy, M., & Vetrugno, I. (2024). Tumor hypoxia and radiotherapy: A major driver of resistance even for novel radiotherapy modalities. *Seminars in cancer biology*, *98*, 19–30. https://doi.org/10.1016/j.semcancer.2023.11.006

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Vaupel, P., & Mayer, A. (2007). Hypoxia in cancer: significance and impact on clinical outcome. *Cancer metastasis reviews*, *26*(2), 225–239. https://doi.org/10.1007/s10555-007-9055-1

2. **Radioterapia Guiada Biológicamente (BRT)**: Concepto y Desarrollo. Definir la BRT como una técnica que adapta espacialmente la dosis de radiación a la información biológica tumoral obtenida mediante imágenes funcionales (PET, fMRI, DWI, etc.).

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Sarma, G., Medhi, P. P., Kashyap, H., Sharma, S. B., Kalita, R., & Lahkar, D. (2024). Understanding Biologically Guided Radiotherapy: Essential Insights for Surgical Oncologists. *Indian journal of surgical oncology*, *15*(Suppl 4), 599–605. https://doi.org/10.1007/s13193-024-02070-1

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Stewart, R. D., & Li, X. A. (2007). BGRT: biologically guided radiation therapy-the future is fast approaching!. *Medical physics*, *34*(10), 3739–3751. https://doi.org/10.1118/1.2779861

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3. **Desafíos y Limitaciones**: retos tecnológicos, regulatorios, de validación clínica y robustez de los biomarcadores.

Bibliografía:

Hall E. J. (2005). Dose-painting by numbers: a feasible approach?. *The Lancet. Oncology*, *6*(2), 66. https://doi.org/10.1016/S1470-2045(05)01718-3

Peng, H., Deng, J., Jiang, S., & Timmerman, R. (2024). Rethinking the potential role of dose painting in personalized ultra-fractionated stereotactic adaptive radiotherapy. *Frontiers in oncology*, *14*, 1357790. https://doi.org/10.3389/fonc.2024.1357790

Thorwarth D. (2015). Functional imaging for radiotherapy treatment planning: current status and future directions-a review. *The British journal of radiology*, *88*(1051), 20150056. https://doi.org/10.1259/bjr.20150056

4. **Perspectivas Futuras**: Exploración de tendencias futuras como la inteligencia artificial para segmentación y predicción, adaptación en tiempo real (ART), integración con terapia dirigida, inmunoterapia y nanomedicina.

Bibliografía:

Escorcia, F. E., Postow, M. A., & Barker, C. A. (2017). Radiotherapy and Immune Checkpoint Blockade for Melanoma: A Promising Combinatorial Strategy in Need of Further Investigation. *Cancer journal (Sudbury, Mass.)*, *23*(1), 32–39. https://doi.org/10.1097/PPO.0000000000000236

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