Sociedad Española de Investigación sobre Cannabinoides

Boletín electrónico (octubre-diciembre 2024; nº 80)
Editor@s: María Ceprián y Pablo Alejandro Reyes

Contenido:

1. Saludo de la Presidenta

Queridos/as socios/as:

Aunque ya se siente lejano, espero que disfrutarais mucho del descanso navideño y que el 2025 venga lleno de salud, felicidad y proyectos motivantes tanto en lo personal como en lo profesional.

Espero también que entre esos proyectos profesionales motivantes esté la asistencia a la próxima Reunión Anual de nuestra sociedad. Sé que es muy pronto para comenzar a hablar de este tema, pero la ocasión lo merece: este año celebraremos nuestro 25º aniversario y con este motivo nos reuniremos en Madrid a finales de noviembre en un evento que queremos que esté a la altura de esta efeméride. Aunque ya tenemos algunas ideas en mente, en los próximos meses os iremos enviando solicitudes de sugerencias y consultas relacionadas con esta actividad.

Por otro lado, y como ya sabéis por un email enviado por nuestra Secretaria (Onintza) hace unos días, Cristina Miralpeix se acaba de incorporar a la Junta Directiva de la SEIC. No quiero dejar pasar esta oportunidad para agradeceros a todos vuestra participación en esta votación y, sobre todo, para agradecer la generosidad de los tres candidatos (Cristina, Lucía Sangroniz y a Iker Bengoetxea) al proponerse para embarcarse en esta

aventura. Estoy segura de que Cristina va a aportar al grupo mucha de esa motivación de la que os hablaba al principio de este mensaje.

Un fuerte abrazo y ánimo con trimestre,
Cristina

2. Premio a la mejor Comunicación Oral Predoctoral. 23ª Reunión Anual de la SEIC, Bordeaux (2023).

VCE-009.1, a novel formulation of natural products with positive allosteric modulatory activity for CB1R

Francisco José Ponce Díaz

Maimonides Biomedical Research Institute of Córdoba (IMIBIC), Cellular Biology, Physiology and Immunology Department, University of Córdoba, Córdoba, Spain.

Due to its expression in the brain and numerous peripheral tissues, functionally CB1R plays an important role in a wide range of physiological conditions, including neuronal development and plasticity, food intake and energy balance, and pain perception and transmission[1]. Because of its involvement in these functions, CB1R has been considered a potential therapeutic target for the treatment of pathologies such as multiple sclerosis, Parkinson's and Huntington's disease, epilepsy, pain and appetite dysregulation and obesity[2,3]. However, their modulation through the use of cannabis formulations or orthosteric agonists, such as Δ9-THC, has been limited by the occurrence of psychoactive effects. Therefore, there is a need to develop therapies or drugs capable of safely and effectively activating this receptor.

In this regard, a type of ligands known as allosteric modulators have been developed, which are able to interact with their target GPCRs by binding to topographically distinct structural regions of orthosteric sites. By interacting with GPCRs, such compounds induce structural changes that stabilise unique conformations, positively or negatively modifying the affinity and signalling efficacy of orthosteric ligands interacting with the receptor[4,5]. In particular, Positive Allosteric Modulators (PAMs) enhance the receptor signalling induced by orthosteric agonists. This type of compound has greater potential for the modulation of CB_1R and, therefore, the treatment of pathologies, such as pain, inflammation, neurological disorders, etc., for which the development of orthosteric agonists has not been effective.

In this study, several plant extracts have been tested for their activities on different targets related to the endocannabinoid system (CB_1R agonism, antagonism and allosterism, CB_2R agonism, and MAGL inhibition). In an initial exploration, 4 extracts with strong CB_1R PAM activity and no orthosteric activity were selected. After validating and characterising these activities using supercritical CO_2 versions of these extracts and performing luciferase assays, molecular docking assays were carried out between CB_1R and the different active compounds present in each of the extracts analysed, identifying the major compounds responsible for the allosteric activity. The CB_1R PAM activity of these compounds was validated by luciferase assays. Later, the 3 extracts with the strongest CB_1R PAM activity were mixed on a 1:1:1 proportion, creating a new formulation named VCE-009.1, whose CB1R PAM activity was characterized. Additionally, other targets involved in pain[6–8] were studied for VCE-009.1,

identifying how this mixture acts as a TRPV-1 antagonist, CB_2R agonist, and antioxidant by reducing ROS levels, activating the expression of Nrf2-regulated genes and inducing the expression of HMOX-1. All the identified activities confer to VCE-009.1 an analgesic, antioxidant and anti-inflammatory potential profile. We therefore decided to study its analgesic activity in vivo using the Randall Selitte (peripheral pain) and Von Frey (central pain) murine pain models, as well as its sedative activity using a murine rotarod model. In both pain models, VCE-009.1 was able to induce high analgesic activity, which was greater than the control analgesics used (morphine and gabapentin, respectively). Subsequent assays have shown the addition of rimonabant completely blocks the analgesic activity, validating the involvement of CB_1R and CB_1R PAM activity. As for the rotarod assay, VCE-009.1 demonstrated sedative activity at the highest dose used. In this case, subsequent assays have shown how the addition of rimonabant partially reduces the sedative effect. Overall, our results demonstrate the potential applicability of VCE-009.1 as a treatment for different types of pain (neuropathic, chronic, inflammatory...) thanks to its biological activities on key pain-related targets.

REFERENCIAS

1. Finn, D. P. et al. Cannabinoids, the endocannabinoid system, and pain: a review of preclinical studies. Pain 162, S5–S25 (2021).
2. Behl, T. et al. Understanding the possible role of endocannabinoid system in obesity. Prostaglandins Other Lipid Mediat. 152, (2021).
3. Han, J. H. & Kim, W. Peripheral CB1R as a modulator of metabolic inflammation. FASEB J. 35, (2021).
4. McElroy, D. L. et al. Antipsychotic potential of the type 1 cannabinoid receptor positive allosteric modulator GAT211: preclinical in vitro and in vivo studies. Psychopharmacology (Berl). 238, 1087–1098 (2021).
5. Hryhorowicz, S. et al. Allosteric Modulation of Cannabinoid Receptor 1-Current Challenges and Future Opportunities. Int. J. Mol. Sci. 20, (2019).
6. Iftinca, M., Defaye, M. & Altier, C. TRPV1-Targeted Drugs in Development for Human Pain Conditions. Drugs 81, 7–27 (2021).
7. Zhou, Y. Q. et al. The therapeutic potential of Nrf2 inducers in chronic pain: Evidence from preclinical studies. Pharmacol. Ther. 225, 107846 (2021).
8. Vanderwall, A. G. & Milligan, E. D. Cytokines in Pain: Harnessing Endogenous Anti-Inflammatory Signaling for Improved Pain Management. Front. Immunol. 10, 1–15 (2019).

3. Premio a la mejor Comunicación Póster Predoctoral. 23ª Reunión Anual de la SEIC, Bordeaux (2023).

CB1 receptors and exercise: are ventral tegmental area dopaminergic neurons necessary for wheel running motivation?

Rim Fayad

Team Endocannabinoids & NeuroAdaptation, INSERM U1215, Bordeaux, France.

Reward processes rely on motivation-("wanting"), consumption("liking") and memory-dependent mechanisms. While "liking" refers to the intrinsic consumption of the reward, "wanting" relates to the reward desire, and hence the efforts put to access that reward. Motivation-based processes have been thoroughly explored, whether natural (food, social interaction...) or drug-related (cocaine, nicotine...) rewards are concerned. One natural reward is of particular interest for us over these recent years, namely physical exercise. Whilst it has been noted that exercise is highly reinforcing in both humans and rodents, pathological changes in the motivation for exercise, associated (or not: exercise addiction) with imbalances in food motivation are observed in obese and anorectic patients. These observations highlight the need to uncover the neurobiological bases of exercise motivation, bases that remain partly unknown. To do so, a paradigm was developed allowing a measure of motivation for wheel running in mice [1] [2]. This paradigm is based on operant conditioning and requires the association of an effort (nose poke) to a reward (1 min of wheel access). A progressive ratio test is used to specifically assess running motivation through the measure of the maximal number of consecutive nose pokes mice perform ("breakpoint"). The results gathered so far indicate that the endocannabinoid system is a key actor in the control of motivation for exercise. Thus, cannabinoid type 1 (CB1) receptors located on ventral tegmental area (VTA) GABAergic neurons likely exert a permissive control on running motivation. Interestingly, these inhibitory neurons are thought to tonically regulate the activity of VTA dopaminergic neurons (mesocorticolimbic pathway). This pathway has been shown to be crucial for reward motivation but whether this extends to exercise motivation is unknown. Indeed, most studies focusing on the role of dopamine in running were performed using free access to wheels, i.e. without any effort prerequisite, which impedes any estimation of motivation for running. However, when using either free or conditioned wheel access, it was observed that the latter was associated with a larger increase of the excitatory tone applied to VTA dopaminergic neurons (as assessed by the AMPA/NMDAR ratio) compared to the former [1]. Furthermore, the firing rate of VTA dopaminergic neurons was positively correlated to exercise motivation [2]. Taken together, these results suggest, but do not prove, that running motivation is accounted for by VTA dopaminergic activity (in line with the aforementioned role of CB1 receptors on VTA GABAergic neurons). To provide a definitive evidence for the involvement of VTA DA activity in exercise motivation, we used DREADDs (Designer Receptor Exclusively Activated by Designer Drugs) to directly modulate cellular activity of VTA dopaminergic neurons, doing so through activation of either Gi/o-coupled signaling cascades (hM4Di) or Gs-signaling cascades (rM3Ds). Both wheel running motivation and consumption were tested. The results obtained so far show a decrease of the breakpoint after inhibition of VTA dopaminergic neurons, suggesting that these neurons are

necessary for exercise motivation. When mice had free access to a wheel, this inhibition had no effect on their performance, highlighting the specificity of the involvement of these neurons in motivation rather than intrinsic consumption (running performance). VTA dopaminergic activation, using the Gs-DREADD expressing virus, did not change either motivation or performance for/of wheel running. On-going experiments are now aimed at estimating whether a direct manipulation of the GABAergic tonic control on dopaminergic neurons would allow to bypass the inhibitory control of running motivation by VTA CB1 receptors

REFERENCIAS

1. Medrano, M.-C., Hurel, I., Mesguich, E., Redon, B., Stevens, C., Geroges, F., Melis, M., Marsicano, G., & Chaouloff, F., 2021. Exercise craving potentiates excitatory inputs to ventral tegmental area dopaminergic neurons. Addiction Biology, 26(3), e12967.
2. Muguruza, C., Redon, B., Fois, G. R., Hurel, I., Scocard, A., Nguyen, C., Stevens, C., Soria-Gomez, E., Varilh, M., Cannich, A., Daniault, J., Busquets-Garcia, A., Pelliccia, T., Caillé, S., Georges, F., Marsicano, G., & Chaouloff, F., 2019. The motivation for exercise over palatable food is dictated by cannabinoid type-1 receptors. JCI Insight, 4(5), e126190, 126190.

4. Premio a la mejor Comunicación Póster Predoctoral. 23ª Reunión Anual de la SEIC, Bordeaux (2023).

In vivo imaging of CB1-dependent modulation of brain metabolism

Tommaso Dalla-Tor

1) Inserm U1215 Neurocentre Magendie, Endocannabinoids and neuroadaptation, Bordeaux, France. 2) Université de Bordeaux, Bordeaux, France. 3)Università di Catania, Catania, Italy

Despite representing only the 2% of the body weight, the brain consumes up to 20% of the body energy. Most of the brain energy comes from the full oxidation of glucose. However, a sizeable amount of glucose is partially oxidized and transformed into Lactate via a process called aerobic glycolysis**.** Most current data point indicate that astrocytes are the main producers of Lactate, which is in turn used by neurons to fulfill their energy requirements[1]. Interestingly, Lactate does not only play a metabolic role, but it is also a fundamental brain signaling molecule[2]. The mechanisms regulating Lactate production and release in the brain are, however, scantly known. Cannabinoid receptors type 1 (CB1R) has recently emerged as an important factor playing a complex role in these processes. Whereas persistent (24h) activation of astroglial CB1R leads to a reduction of Lactate[3], our recent data show that their transient stimulation (5 min) triggers an increase of Lactate levels[4]. These data, however, were obtained mainly in cultured astrocytes, and the impact of CB1R activity on Lactate levels in vivo has never been directly measured. By combining a novel Lactate fluorescent biosensor (eLacco2.1)[5] and fiber photometry (FP), we carried out successfully for the first-time high-

resolution recordings of brain Lactate dynamics in freely moving animals. Interestingly, we observed that the levels of Lactate correlate with locomotor activity, revealing that the transition from activity to inactivity was reliably accompanied with decreased levels of hippocampal Lactate, in a THC-independent way. Consequently, since one of the main effects of high doses cannabinoids in mice is a drastic reduction of locomotion, accompanied by other effects, including antinociception[6], we wondered whether Lactate might play a role in these cannabinoid effects. We observed that Lactate administration blocks hypolocomotor effects of cannabinoids, while it did not alter the antinociceptive effect of THC, indicating a specific causal role of Lactate in the hypolocomotor effect of cannabinoid drugs. Overall, these results unveil an unexpected relationship between CB1R signaling, Lactate levels, and locomotor activity.

REFERENCIAS

1. Magistretti PJ, Allaman I. Lactate in the brain: from metabolic end-product to signalling molecule. Nat Rev Neurosci. 2018 Apr;19(4):235-249. doi: 10.1038/nrn.2018.19. Epub 2018 Mar 8. PMID: 29515192.
2. Suzuki A, et al. Astrocyte-neuron lactate transport is required for long-term memory formation. Cell. 2011 Mar 4;144(5):810-23. doi: 10.1016/j.cell.2011.02.018. PMID: 21376239; PMCID: PMC3073831.
3. Hebert-Chatelain E, *et al*. A cannabinoid link between mitochondria and memory. Nature. 2016 Nov 24;539(7630):555-559. doi: 10.1038/nature20127. Epub 2016 Nov 9. PMID: 27828947.
4. Fernández-Moncada I, et al. A lactate-dependent shift of glycolysis mediates synaptic and cognitive processes in male mice. Nat Commun. 2024 Aug 9;15(1):6842. doi: 10.1038/s41467-024-51008-2. PMID: 39122700; PMCID: PMC11316019.
5. Nasu Y, et al. Lactate biosensors for spectrally and spatially multiplexed fluorescence imaging. Nat Commun. 2023 Oct 27;14(1):6598. doi: 10.1038/s41467-023-42230-5. PMID: 37891202; PMCID: PMC10611801.
6. Stella N. THC and CBD: Similarities and differences between siblings. Neuron. 2023 Feb 1;111(3):302-327. doi: 10.1016/j.neuron.2022.12.022. Epub 2023 Jan 12. PMID: 36638804; PMCID: PMC9898277.

5. Crónica de la 24ª Reunión Anual de la SEIC, Córdoba (2024)

La última semana de noviembre tuvo lugar la 24ª Reunión de nuestra Sociedad, celebrada en la encantadora ciudad de Córdoba. Un total de 101 participantes disfrutamos de un ambiente inigualable, un nivel científico de excelencia y escenarios verdaderamente memorables.

La reunión dio inicio con la Conferencia Inaugural a cargo de Manuel Guzmán, galardonado con el Premio Mechoulam Award 2024. En su inspiradora charla, Guzmán repasó su brillante trayectoria científica y su papel clave en el estudio de los cannabinoides y el cáncer, abarcando desde la investigación básica hasta la clínica. Además, destacó con claridad el prometedor potencial terapéutico del THC. El "hot topic" estuvo a cargo de Carola Pérez, presidenta del Observatorio Español de Cannabis Medicinal y fundadora de la asociación de usuarios terapéuticos Dosemociones. Pérez ofreció una valiosa perspectiva desde el punto de vista del paciente, relatando con

detalle el complejo y desafiante camino hacia la aprobación del cannabis medicinal. Finalmente, Javier Fernández Ruiz presentó el Máster Universitario en Investigación sobre Cannabis Medicinal, un proyecto innovador y lleno de potencial para impulsar el avance científico en este campo emergente.

Durante los días de la reunión, tuvimos el privilegio de disfrutar de 23 comunicaciones orales y 29 pósteres que abordaron el papel de los cannabinoides en diversas células y sistemas, así como su implicación en diferentes comportamientos y enfermedades del sistema nervioso, la adicción, el cáncer y el síndrome metabólico. La excelencia científica de las contribuciones quedó evidenciada en la entrega de ocho premios, que reconocieron las mejores investigaciones en las categorías predoctoral y postdoctoral.

El entorno incomparable de Córdoba brindó un marco excepcional a este evento. El congreso tuvo lugar en las proximidades de la emblemática Mezquita-Catedral, un tesoro histórico que muchos asistentes aprovechamos para visitar durante su estancia. La cena de gala, celebrada en las majestuosas Caballerizas Reales, se convirtió en uno de los momentos más memorables, seguida por la tradicional fiesta de nuestra Sociedad.

Una vez más, este congreso destacó no solo por su excelencia científica, sino también por la calidez y el espíritu de comunidad que definen a nuestra Sociedad. ¡Gracias a todos por hacerlo posible!

6. Agenda

35th Annual International Cannabinoid Research - Bloomington (Indiana, EEUU)
6-11 Julio, 2025

***Gordon Research Conferences*: Cannabinoid Neurobiology: Bridging Basic Science, Big Data, Biomarkers and Bedside Applications Across the Lifespan – Waterville Valley (New Hampshire EEUU)**
17-22 Agosto, 2025

7. Últimas publicaciones sobre cannabinoides de investigadores/as españoles (periodo octubre-diciembre 2024)

Sánchez-Sanz A, Coronado-Albi MJ, Muñoz-Viana R, García-Merino A, Sánchez-López AJ. ***Neuroprotective and Anti-Inflammatory Effects of Dimethyl Fumarate, Monomethyl Fumarate, and Cannabidiol in Neurons and Microglia***. Int J Mol Sci. 2024 Dec 5;25(23):13082.
DOI: 10.3390/ijms252313082. PMID: 39684792.

Mesas C, Moreno J, Doello K, Peña M, López-Romero JM, Prados J, Melguizo C. ***Cannabidiol effects in stem cells: A systematic review***. Biofactors. 2024 Dec 9.
DOI: 10.1002/biof.2148. Epub ahead of print. PMID: 39653426.

Borrell-Pichot M, Fons C, Boronat S, Sierra-Marcos A. ***Successful management of refractory epilepsy in creatine transporter deficiency with cannabidiol and clobazam: A case report***. Epilepsia Open. 2024 Dec 16.
DOI: 10.1002/epi4.13116. Epub ahead of print. PMID: 39679854.

Medina AA, Miguel AS, Cortés SF, Martín-Armentia B, Pineda F. ***Bronchial Challenge in the Diagnosis of Cannabis Allergy***. Curr Allergy Asthma Rep. 2024 Dec 21;25(1):8.
DOI: 10.1007/s11882-024-01190-6. PMID: 39707029.

Sánchez de la Torre A, Ezquerro-Herce S, Huerga-Gómez A, Sánchez-Martín E, Chara JC, Matute C, Monory K, Mato S, Lutz B, Guzmán M, Aguado T, Palazuelos J. ***CB_1 receptors in NG2 cells mediate cannabinoid-evoked functional myelin regeneration***. Prog Neurobiol. 2024 Dec;243:102683.
DOI: 10.1016/j.pneurobio.2024.102683. Epub 2024 Nov 9. PMID: 39528076.

Lamberti A, Serafini M, Aprile S, Bhela IP, Goutsiou G, Pessolano E, Fernandez-Ballester G, Ferrer-Montiel A, Di Martino RMC, Fernandez-Carvajal A, Pirali T. ***The multicomponent Passerini reaction as a means of accessing diversity in structure, activity and properties: Soft and hard vanilloid/cannabinoid modulators***. Eur J Med Chem. 2024 Dec 5;279:116845.

DOI: 10.1016/j.ejmech.2024.116845. Epub 2024 Sep 7. PMID: 39265249.

Valeria S, Francesco T, Sonia A, Laura VP, Luca C, Marcello S, Roberta L, Patrizia P, Arnau BG, Roberto F, Miriam M. ***Sex-specific maladaptive responses to acute stress upon in utero THC exposure are mediated by dopamine***. Pharmacol Res. 2024 Dec;210:107536.
DOI: 10.1016/j.phrs.2024.107536. Epub 2024 Nov 30. PMID: 39622370.

Solano-Orrala D, Silva-Cullishpuma DA, Díaz-Cruces E, Gómez-López VM, Toro-Mendoza J, Gomez d'Ayala G, Troconis J, Narváez-Muñoz C, Alexis F, Mercader-Ros MT, Lucas-Abellán C, Zamora-Ledezma C. ***Exploring the Potential of Nonpsychoactive Cannabinoids in the Development of Materials for Biomedical and Sports Applications***. ACS Appl Bio Mater. 2024 Dec 16;7(12):8177-8202.
DOI: 10.1021/acsabm.4c01402. Epub 2024 Nov 20. PMID: 39563525.

Llorca-Bofí V, Mur M, Font M, Palacios-Garrán R, Sellart M, Del Agua-Martínez E, Bioque M, Arteaga-Henríquez G***. Differences in total and differential white blood cell counts and in inflammatory parameters between psychiatric inpatients with and without recent consumption of cannabinoids, opioids, or cocaine: A retrospective single-center study***. Brain Behav Immun Health. 2024 Nov 6;42:100898.
DOI: 10.1016/j.bbih.2024.100898. PMID: 39634076.

Roldan L, Sánchez-Gutiérrez T, Fernández-Arias I, Rodríguez-Toscano E, López G, Merchán-Naranjo J, Calvo A, Rapado-Castro M, Parellada M, Moreno C, Ferraro L, La Barbera D, La Cascia C, Tripoli G, Di Forti M, Murray RM, Quattrone D, Morgan C, Gayer-Anderson C, Jones PB, Jongsma HE, Kirkbride JB, van Os J, García-Portilla P, Al-Halabí S, Bobes J, de Haan L, Bernardo M, Santos JL, Sanjuán J, Arrojo M, Szoke A, Rutten BP, Stilo SA, Tarricone I, Lasalvia A, Tosato S, Llorca PM, Menezes PR, Selten JP, Tortelli A, Velthorst E, Del-Ben CM, Arango C, Díaz-Caneja CM. ***Cannabis use and cognitive biases in people with first-episode psychosis and their siblings***. Psychol Med. 2024 Nov 22;54(15):1-11.
DOI: 10.1017/S0033291724001715. Epub ahead of print. PMID: 39575607.

De la Fuente M, Joyera N, Félix J, Díaz-Del Cerro E, Linillos-Pradillo B, Rancan L, Tresguerres JAF. ***Cannabidiol, a Strategy in Aging to Improve Redox State and Immunity in Male Rats***. Int J Mol Sci. 2024 Nov 15;25(22):12288.
DOI: 10.3390/ijms252212288. PMID: 39596353

Forner-Piquer I, Giommi C, Sella F, Lombó M, Montik N, Dalla Valle L, Carnevali O. ***Endocannabinoid System and Metabolism: The Influences of Sex***. Int J Mol Sci. 2024 Nov 6;25(22):11909.

DOI: 10.3390/ijms252211909. PMID: 39595979

Rivas-Santisteban R, Muñoz A, Lillo J, Raïch I, Rodríguez-Pérez AI, Navarro G, Labandeira-García JL, Franco R. ***Cannabinoid regulation of angiotensin II-induced calcium signaling in striatal neurons. NPJ Parkinsons Dis***. 2024 Nov 15;10(1):220.
DOI: 10.1038/s41531-024-00827-7. PMID: 39548112.

Moreno-Rodríguez M, Martínez-Gardeazabal J, Bengoetxea de Tena I, Llorente-Ovejero A, Lombardero L, González de San Román E, Giménez-Llort L, Manuel I, Rodríguez-Puertas R. ***Cognitive improvement via cortical cannabinoid receptors and choline-containing lipids***. Br J Pharmacol. 2024 Nov 3.
DOI: 10.1111/bph.17381. Epub ahead of print. PMID: 39489624.

Burgaz S, Navarro E, Rodríguez-Carreiro S, Navarrete C, Garrido-Rodríguez M, Lastres-Becker I, Chocarro J, Lanciego JL, Muñoz E, Fernández-Ruiz J. ***Investigation in the cannabigerol derivative VCE-003.2 as a disease-modifying agent in a mouse model of experimental synucleinopathy***. Behav Brain Funct. 2024 Nov 1;20(1):28.
DOI: 10.1186/s12993-024-00256-9. PMID: 39487447.

Mata-Pesquera M, Fabregat-Safont D, Sancho JV, Ibáñez M. ***Exploiting the triple quadrupole mass analyzer for the open detection and tentative identification of synthetic cannabinoid receptor agonists based on common fragmentation pathways.*** Anal Chim Acta. 2024 Nov 15;1329:343226.
DOI: 10.1016/j.aca.2024.343226. Epub 2024 Sep 10. PMID: 39396291.

Guardiola-Ripoll M, Sotero-Moreno A, Chaumette B, Kebir O, Hostalet N, Almodóvar-Payá C, Moreira M, Giralt-López M, Krebs MO, Fatjó-Vilas M. ***Genetic and Neurodevelopmental Markers in Schizophrenia-Spectrum Disorders: Analysis of the Combined Role of the CNR1 Gene and Dermatoglyphics***. Biomedicines. 2024 Oct 7;12(10):2270.
DOI: 10.3390/biomedicines12102270. PMID: 39457583

Dempster EL, Wong CCY, Burrage J, Hannon E, Quattrone D, Trotta G, Rodriguez V, Alameda L, Spinazzola E, Tripoli G, Austin-Zimmerman I, Li Z, Gayer-Anderson C, Freeman TP, Johnson EC, Jongsma HE, Stilo S, La Cascia C, Ferraro L, La Barbera D, Lasalvia A, Tosato S, Tarricone I, D'Andrea G, Galatolo M, Tortelli A, Pompili M, Selten JP, de Haan L, Menezes PR, Del Ben CM, Santos JL, Arrojo M, Bobes J, Sanjuán J, Bernardo M, Arango C, Jones PB, Breen G, Mondelli V, Dazzan P, Iyegbe C, Vassos E, Morgan C, Mukherjee D, van Os J, Rutten B, O'Donovan MC, Sham P, Mill J, Murray R, Di Forti M. ***Methylomic signature of current cannabis use in two first-episode psychosis cohorts***. Mol Psychiatry. 2024 Oct 16.

DOI: 10.1038/s41380-024-02689-0. Epub ahead of print. PMID: 39406996.

Boals AG, Collier DM, Romero JR, Hillard CJ, Park F. ***Lack of Cannabinoid Type 2 Promoter Activity in Normal or Injured Kidneys Using a Cnr2-GFP Reporter Mouse.*** Cannabis Cannabinoid Res. 2024 Oct 9.
DOI: 10.1089/can.2024.0142. Epub ahead of print. PMID: 39381839.

Moya-Utrera F, Fuentes-Ríos D, Romero-Carrasco A, Doña-Flores M, Cheng-Sánchez I, Díaz-Morilla A, Soledad Pino-González M, Martínez-Ferez A, Moreno J, Mesas C, Melguizo C, Prados J, Sarabia F, López-Romero JM. ***Synthesis of (-)-Cannabidiol (CBD), (-)-Δ^9- and (-)-Δ^8-Tetrahydrocannabinols, Encapsulation of CBD with Nanoparticles for Controlled Delivery and Biological Evaluation***. Chemistry. 2024 Dec 13;30(70):e202402496.
DOI: 10.1002/chem.202402496. Epub 2024 Oct 31. PMID: 39307687.

González-Roz A, Iza-Fernández C, Alemán-Moussa L, Secades-Villa R. ***Prevalence and correlates of driving under the influence of alcohol and cannabis among Spanish adolescents***. J Stud Alcohol Drugs. 2024 Oct 30.
DOI: 10.15288/jsad.24-00132. Epub ahead of print. PMID: 39475163.

Cásedas G, Yarza-Sancho M, López V. ***Cannabidiol (CBD): A Systematic Review of Clinical and Preclinical Evidence in the Treatment of Pain***. Pharmaceuticals (Basel). 2024 Oct 28;17(11):1438.
DOI: 10.3390/ph17111438. PMID: 39598350

Misa Garcia A, Ferro Rodríguez S. ***Cannabis hyperemesis syndrome: an emerging clinical and public health challenge***. Eur J Hosp Pharm. 2024 Oct 15:ejhpharm-2024-004369.
DOI: 10.1136/ejhpharm-2024-004369. Epub ahead of print. PMID: 39406458.

Composición de la Junta Directiva de la SEIC

Presidenta: Cristina Sánchez (Universidad Complutense de Madrid)

Vicepresidente: Andrés Ozaita (Universidad Pompeu Fabra, Barcelona)

Secretaria: Onintza Sagredo (Universidad Complutense de Madrid)

Tesorera: Nadine Jagerovic (Instituto de Química Médica-CSIC, Madrid)

Vocales:

Nagore Puente (Universidad del País Vasco)

Patricia Rivera (Hospital Universitario Regional de Málaga-IBIMA)

Leyre Urigüen (Universidad del País Vasco)

Gunter van der Walt (Universidad Autónoma de Barcelona)

Dirección de contacto de la SEIC

Sociedad Española de Investigación sobre Cannabinoides (SEIC)
Departamento de Bioquímica y Biología Molecular
Facultad de Medicina, Universidad Complutense
Ciudad Universitaria, s/n, 28040 Madrid
Teléfono: 913941450/4; e-mail: **info@seic.es**
Dirección Web: **http://www.seic.es**
Dirección redes sociales: **rrsseic@seic.es**