

metabolomics

NCT Number		Title	Authors	Description	Identifier	Dates
1	pubmed:36049454	<a href="#">XXXI Congress of the Spanish Nutrition Society (SEÑ) Cartagena (Spain), 15th to 17th September 2022. Topic: Personalized Nutrition and Health</a>	Elvira Larqué	It is a plaesasure to announce the celebration of the XXXI Congress of the Spanish Nutrition Society that will be held in Cartagena (Murcia, Spain), from September 15th to 17th, 2022. As is already a tradition in our society, the day before, on September 14th, the IX Meeting of young researchers will take place, aimed at promoting interaction and knowledge exchange among young people working in the field of nutrition and food in Spain. In addition, young reserachers will receive a workshop about...	pmid:36049454 doi:10.1159/000526374	Thu, 01 Sep 2022 06:00:00 -0400
2	pubmed:36049525	<a href="#">Changes in carbon allocation and subplastidal amyloplast structures of specialised Ipomoea batatas (sweet potato) storage root phenotypes</a>	Margit Drapal Christopher Gerrish Paul D Fraser	Vitamin A deficiency (VAD) in Low and Medium Income countries remains a major health concern. Ipomoea batatas, orange sweet potato (OSP), is one of the biofortification solutions being implemented by the World Health Organisation (WHO) to combat VAD. However, high provitamin A (-carotene) content has been associated with a reduction in dry matter, reducing calorific value and having adverse effects on consumer traits. Both starch and carotenoid formation are located in amyloplasts and could...	pmid:36049525 doi:10.1016/j.phytochem.2022.113409	Thu, 01 Sep 2022 06:00:00 -0400
3	pubmed:36049653	<a href="#">NMR-based metabolomic analysis for the effects of moxibustion on imiquimod-induced psoriatic mice</a>	Feng Huang Tong Zhang Bin Li Shaosong Wang Chang Xu Caihua Huang Donghai Lin	CONCLUSIONS: This study reveals the molecular mechanisms underlying the effects of moxibustion treatment on the skin lesions of psoriasis, potentially improving the clinical efficacy of moxibustion.	pmid:36049653 doi:10.1016/j.jep.2022.115626	Thu, 01 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
4	pubmed:36050461	<a href="#">Dynamic genome evolution in a model fern</a>	D Blaine Marchant Guang Chen Shengguan Cai Fei Chen Peter Schafran Jerry Jenkins Shengqiang Shu Chris Plott Jenell Webber John T Lovell Guifen He Laura Sandor Melissa Williams Shanmugam Rajasekar Adam Healey Kerrie Barry Yinwen Zhang Emily Sessa Rijan R Dhakal Paul G Wolf Alex Harkess Fay-Wei Li Clemens Rössner Annette Becker Lydia Gramzow Dawei Xue Yuhuan Wu Tao Tong Yuanyuan Wang Fei Dai Shuijin Hua Hua Wang Shengchun Xu Fei Xu Honglang Duan Günter Theißen Michael R McKain Zheng Li Michael T W McKibben Michael S Barker Robert J Schmitz Dennis W Stevenson Cecilia Zumajo-Cardona Barbara A Ambrose James H Leebens-Mack Jane Grimwood Jeremy Schmutz Pamela S Soltis Douglas E Soltis Zhong-Hua Chen	The large size and complexity of most fern genomes have hampered efforts to elucidate fundamental aspects of fern biology and land plant evolution through genome-enabled research. Here we present a chromosomal genome assembly and associated methylome, transcriptome and metabolome analyses for the model fern species <i>Ceratopteris richardii</i> . The assembly reveals a history of remarkably dynamic genome evolution including rapid changes in genome content and structure following the most recent...	pmid:36050461 doi:10.1038/s41477-022-01226-7	Thu, 01 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
5	pubmed:36050466	<a href="#">Brown adipose tissue dysfunction promotes heart failure via a trimethylamine N-oxide-dependent mechanism</a>	Yohko Yoshida Ippei Shimizu Atsuhiko Shimada Keita Nakahara Sachiko Yanagisawa Minoru Kubo Shinji Fukuda Chiharu Ishii Hiromitsu Yamamoto Takamasa Ishikawa Kuniyuki Kano Junken Aoki Goro Katsuumi Masayoshi Suda Kazuyuki Ozaki Yutaka Yoshida Shujiro Okuda Shigeo Ohta Shiki Okamoto Yasuhiko Minokoshi Kanao Oda Toshikuni Sasaoka Manabu Abe Kenji Sakimura Yoshiaki Kubota Norihiko Yoshimura Shingo Kajimura Maria Zuriaga Kenneth Walsh Tomoyoshi Soga Tohru Minamino	Low body temperature predicts a poor outcome in patients with heart failure, but the underlying pathological mechanisms and implications are largely unknown. Brown adipose tissue (BAT) was initially characterised as a thermogenic organ, and recent studies have suggested it plays a crucial role in maintaining systemic metabolic health. While these reports suggest a potential link between BAT and heart failure, the potential role of BAT dysfunction in heart failure has not been investigated. Here,...	pmid:36050466 doi:10.1038/s41598-022-19245-x	Thu, 01 Sep 2022 06:00:00 -0400
6	pubmed:36050631	<a href="#">Learning a confidence score and the latent space of a new supervised autoencoder for diagnosis and prognosis in clinical metabolomic studies</a>	David Chardin Cyprien Gille Thierry Pourcher Olivier Humbert Michel Barlaud	CONCLUSION: In this paper, we describe a new efficient SAE method to support diagnostic or prognostic evaluation based on metabolomics analyses.	pmid:36050631 doi:10.1186/s12859-022-04900-x	Thu, 01 Sep 2022 06:00:00 -0400
7	pubmed:36050754	<a href="#">MIRTH: Metabolite Imputation via Rank-Transformation and Harmonization</a>	Benjamin A Freeman Sophie Jaro Tricia Park Sam Keene Wesley Tansey Ed Reznik	Out of the thousands of metabolites in a given specimen, most metabolomics experiments measure only hundreds, with poor overlap across experimental platforms. Here, we describe Metabolite Imputation via Rank-Transformation and Harmonization (MIRTH), a method to impute unmeasured metabolite abundances by jointly modeling metabolite covariation across datasets which have heterogeneous coverage of metabolite features. MIRTH successfully recovers masked metabolite abundances both within single...	pmid:36050754 doi:10.1186/s13059-022-02738-3	Thu, 01 Sep 2022 06:00:00 -0400
8	pubmed:36050758	<a href="#">Global contribution of pelagic fungi to protein degradation in the ocean</a>	Eva Breyer Zihao Zhao Gerhard J Herndl Federico Baltar	CONCLUSIONS: Our findings expand the current knowledge on the role of oceanic fungi in the carbon cycle (carbohydrates) to the so far unknown global participation in nitrogen (proteins) degradation, highlighting potentially different ecological niches occupied by fungi and prokaryotes in the global ocean. Video Abstract.	pmid:36050758 doi:10.1186/s40168-022-01329-5	Thu, 01 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
9	pubmed:36050762	<a href="#">Control of redox potential in a novel continuous bioelectrochemical system led to remarkable metabolic and energetic responses of Clostridium pasteurianum grown on glycerol</a>	Philipp Arbter Niklas Widderich Tyll Utesch Yaeseong Hong An-Ping Zeng	CONCLUSIONS: The results show that electrochemical ORP alteration is a suitable tool to steer the metabolism of C. pasteurianum and increase product yield for 1,3-propanediol in continuous culture. The approach might also be useful for application with further anaerobic or anoxic bioprocesses. However, to maximize the technique's efficiency, it is essential to understand the chemistry behind the ORP change and how the microbial system responds to it by transmitted or direct effects.	pmid:36050762 doi:10.1186/s12934-022-01902-5	Thu, 01 Sep 2022 06:00:00 -0400
10	pubmed:36050843	<a href="#">A seed-like proteome in oil-rich tubers</a>	Philipp William Niemeyer Iker Irisarri Patricia Scholz Kerstin Schmitt Oliver Valerius Gerhard H Braus Cornelia Herrfurth Ivo Feussner Shrikant Sharma Anders S Carlsson Jan de Vries Per Hofvander Till Ischebeck	There are numerous examples of plant organs or developmental stages that are desiccation tolerant and can withstand extended periods of severe water loss. One prime example are seeds and pollen of many spermatophytes. However, in some plants, also vegetative organs can be desiccation tolerant. One example are the tubers of yellow nutsedge (Cyperus esculentus) that also store larger amounts of lipids similar to seeds. Interestingly, the closest known relative, purple nutsedge (Cyperus rotundus),...	pmid:36050843 doi:10.1111/tpj.15964	Fri, 02 Sep 2022 06:00:00 -0400
11	pubmed:36050860	<a href="#">The 677C&gt;T variant in methylenetetrahydrofolate reductase causes morphological and functional cerebrovascular deficits in mice</a>	Alaina M Reagan Karen E Christensen Leah C Graham Amanda A Bedwell Kierra Eldridge Rachael Speedy Lucas L Figueiredo Scott C Persohn Teodoro Bottiglieri Kwangsik Nho Michael Sasner Paul R Territo Rima Rozen Gareth R Howell	Vascular contributions to cognitive impairment and dementia (VCID) particularly Alzheimer's disease and related dementias (ADRDs) are increasing; however, mechanisms driving cerebrovascular decline are poorly understood. Methylenetetrahydrofolate reductase (MTHFR) is a critical enzyme in the folate and methionine cycles. Variants in MTHFR, notably 677 C > T, are associated with dementias, but no mouse model existed to identify mechanisms by which MTHFR^(677C > T) increases risk. Therefore,...	pmid:36050860 doi:10.1177/0271678X221122644	Fri, 02 Sep 2022 06:00:00 -0400
12	pubmed:36051232	<a href="#">Comparative Metabolomics study of flavonoids in the pericarp of different coloured bitter gourds (Momordica charantia L.)</a>	Hongmei Zhang Xuan Du Jizhu Yu Haijun Jin Na Liu	Bitter gourd (Momordica charantia L.) is a member of Cucurbitaceae family and has long been used as a source of food and medicine for its rich bioactive components or secondary metabolites. However, there are relatively few large-scale detection, identification, and quantitative studies on flavonoids in the pericarp of bitter gourds of different colours. To determine the differences in the diversity and specificity of flavonoids in the pericarp of bitter gourd of different colours, the metabolic...	pmid:36051232 pmc:PMC9424440 doi:10.1007/s12298-022-01210-7	Fri, 02 Sep 2022 06:00:00 -0400
13	pubmed:36051902	<a href="#">Effects of serial and acute enteric-coated sodium bicarbonate supplementation on anaerobic performance, physiological profile, and metabolomics in healthy young men</a>	Nihong Zhou Yongzhao Fan Xiaoyang Kong Xiangyu Wang Junde Wang Hao Wu	CONCLUSIONS: Our study indicates that serial enteric-coated sodium bicarbonate supplementation positively improves anaerobic performance among healthy young men. However, acute ingestion of enteric-coated sodium bicarbonate did not improve anaerobic exercise performance. Either with serial or acute supplementation doses, enteric-coated sodium bicarbonate produced fewer gastrointestinal symptoms and no difference compared to placebo, especially with no gastrointestinal side effects after serial...	pmid:36051902 pmc:PMC9424542 doi:10.3389/fnut.2022.931671	Fri, 02 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
14	pubmed:36052171	<a href="#">Oleaginous yeast <i>Rhodotorula toruloides</i> biomass effect on the metabolism of Arctic char (<i>Salvelinus alpinus</i>)</a>	Mathilde Brunel Viktoriia Burkina Jana Pickova Sabine Sampels Ali A Moazzami	Sustainability issues arise when using fish oil and vegetable oils in fish feed production for aquaculture purposes. Microbial production of single cell oil is a potential alternative as a lipid ingredient in the production of fish feed. In this study, we replaced the vegetable oils with the oleaginous yeast <i>R. toruloides</i> biomass in the diet of Arctic char ( <i>S. alpinus</i> ) and investigated the effects on health and composition. Measurement of fish growth parameters showed a higher liver weight and...	pmid:36052171 pmc:PMC9425082 doi:10.3389/fmolb.2022.931946	Fri, 02 Sep 2022 06:00:00 -0400
15	pubmed:36052548	<a href="#">Integrated multi-omic analysis of Huntington disease and yeast model delineates pathways modulating protein aggregation</a>	Sai Sanwid Pradhan Sai Manohar Thota R Saiswaroop Sai Krishna Srimadh Bhagavatham Sujith Kumar Pulukool Sriram Rathnakumar Kanikaram Sai Phalguna Rajesh Babu Dandamudi Ashish Pargaonkar Prasanth Joseph Joshy E V Venketesh Sivaramakrishnan	Huntington's disease (HD) is a neurodegenerative disease associated with polyglutamine expansion in the protein Huntingtin. Though the polyglutamine repeat length correlates with the age of onset and severity, the complication points to disease modifiers. Mitochondrial dysfunction and metabolic deregulation are associated with the disease. Despite multi-omic characterization of patients and model systems, the mechanisms have remained elusive. Systems analysis of multi-omics data and its...	pmid:36052548 doi:10.1242/dmm.049492	Fri, 02 Sep 2022 06:00:00 -0400
16	pubmed:36052690	<a href="#">Differences in Metabolomic Profiles Between Black and White Women and Risk of Coronary Heart Disease: an Observational Study of Women From Four US Cohorts</a>	Jie Hu Jie Yao Shuliang Dseng Raji Balasubramanian Monik C Jiménez Jun Li Xiuqing Guo Daniel E Cruz Yan Gao Tianyi Huang Oana A Zeleznik Debby Ngo Simin Liu Milagros C Rosal Rami Nassir Nina P Paynter Christine M Albert Russell P Tracy Peter Durda Yongmei Liu Kent D Taylor W Craig Johnson Qi Sun Eric B Rimm A Heather Eliassen Stephen S Rich Jerome I Rotter Robert E Gerszten Clary B Clish Kathryn M Rexrode	CONCLUSIONS: Metabolomic profiles significantly and substantially differ between Black and White women and may be associated with CHD risk and racial disparities in US women.	pmid:36052690 doi:10.1161/CIRCRESAHA.121.320134	Fri, 02 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
17	pubmed:36052815	<a href="#">The use of various statistical methods for authenticity and detection of adulteration in fish and seafood</a>	Konstantinos Kotsanopoulos Petros V Martsikalis George A Gkafas Athanasios Exadactylos	Various methodologies including genetic analyses, morphometrics, proteomics, lipidomics, metabolomics, etc. are now used or being developed to authenticate fish and seafood. Such techniques usually lead to the generation of enormous amounts of data. The analysis and interpretation of this information can be particularly challenging. Statistical techniques are therefore commonly used to assist in analyzing these data, visualizing trends and differences and extracting conclusions. This review...	pmid:36052815 doi:10.1080/10408398.2022.2117786	Fri, 02 Sep 2022 06:00:00 -0400
18	pubmed:36052997	<a href="#">Crosstalk between AML and stromal cells triggers acetate secretion through the metabolic rewiring of stromal cells</a>	Nuria Vilaplana-Lopera Vincent Cuminetti Ruba Almaghrabi Grigorios Papatzikas Ashok Kumar Rout Mark Jeeves Elena González Yara Alyahyawi Alan Cunningham Ayegüll Erdem Frank Schnütgen Manoj Raghavan Sandeep Potluri Jean-Baptiste Cazier Jan Jacob Schuringa Michelle A C Reed Lorena Arranz Ulrich Günther Paloma Garcia	Acute myeloid leukaemia (AML) cells interact and modulate components of their surrounding microenvironment into their own benefit. Stromal cells have been shown to support AML survival and progression through various mechanisms. Nonetheless, whether AML cells could establish beneficial metabolic interactions with stromal cells is underexplored. By using a combination of human AML cell lines and AML patient samples together with mouse stromal cells and a MLL-AF9 mouse model, here we identify a...	pmid:36052997 doi:10.7554/eLife.75908	Fri, 02 Sep 2022 06:00:00 -0400
19	pubmed:36053831	<a href="#">Multi-omics in classical galactosemia: Evidence for the involvement of multiple metabolic pathways</a>	Merel E Hermans Michel van Weeghel Frédéric M Vaz Sacha Ferdinandusse Carla E M Hollak Hidde H Huidekoper Mirian C H Janssen André B P van Kuilenburg Mia L Pras-Raves Mirjam M C Wamelink Ronald J A Wanders Mendy M Welsink-Karssies Annet M Bosch	Classical galactosemia (CG) is one of the more frequent inborn errors of metabolism affecting approximately 1:40.000 people. Despite a life-saving galactose-restricted diet, patients develop highly variable long-term complications including intellectual disability and movement disorders. The pathophysiology of these complications is still poorly understood and development of new therapies is hampered by a lack of valid prognostic biomarkers. Multi-omics approaches may discover new biomarkers and...	pmid:36053831 doi:10.1002/jimd.12548	Fri, 02 Sep 2022 06:00:00 -0400
20	pubmed:36053852	<a href="#">Metabolomic and transcriptomic analyses identify quinic acid protecting eggplant from damage caused by western flower thrips</a>	Yajing Liu Xuan Wang Shuangxia Luo Lisong Ma Weiwei Zhang Shuxin Xuan Yanhua Wang Jianjun Zhao Shuxing Shen Wei Ma Aixia Gu Xueping Chen	CONCLUSION: Our results showed that quinic acid plays a key role in the resistance to thrips. These findings highlight a potential application of quinic acid as a biocontrol agent to manage thrips and expand our knowledge to breed thrips-resistant eggplant. © 2022 Society of Chemical Industry.	pmid:36053852 doi:10.1002/ps.7129	Fri, 02 Sep 2022 06:00:00 -0400



NCT Number		Title	Authors	Description	Identifier	Dates
21	pubmed:36053871	<a href="#">Azadirachtin inhibits the development and metabolism of the silk glands of Spodoptera frugiperda and affects spinning behaviour</a>	Weihua Zhao Qun Zheng Deqiang Qin Peiru Luo Cuiyi Ye Shigang Shen Dongmei Cheng Suqing Huang Lihui Liu Hanhong Xu Zhixiang Zhang	CONCLUSIONS: This study provides a preliminary report of the effect of azadirachtin on the spinning behaviour of the S. frugiperda larvae. Metabolomic results indicated that histidine, glycine and leucine, which are related to serine protein synthesis, were down-regulated. Azadirachtin can damage the silk glands of S. frugiperda and thus affect spinning behaviour. This provides the basis for the control of S. frugiperda by spinning silk. This article is protected by copyright. All rights...	pmid:36053871 doi:10.1002/ps.7151	Fri, 02 Sep 2022 06:00:00 -0400
22	pubmed:36054136	<a href="#">Widely targeted metabolomics reveals stamen petaloid tissue of Paeonia lactiflora Pall. being a potential pharmacological resource</a>	Xianghui Liu Ye Chen Jingxiao Zhang Yifan He Huiyuan Ya Kai Gao Huizhi Yang Wanyue Xie Lingmei Li	Paeonia lactiflora Pall. has a long edible and medicinal history because of the very high content of biologically active compounds. However, little information is available about the metabolic basis of pharmacological values of P. lactiflora flowers. In this study, we investigated metabolites in the different parts of P. lactiflora flowers, including petal, stamen petaloid tissue and stamen, by widely targeted metabolomics approach. A total of 1102 metabolites were identified, among which 313...	pmid:36054136 doi:10.1371/journal.pone.0274013	Fri, 02 Sep 2022 06:00:00 -0400
23	pubmed:36054352	<a href="#">Altered epidermal proliferation, differentiation, and lipid composition: Novel key elements in the vitiligo puzzle</a>	Daniela Kovacs Emanuela Bastonini Stefania Briganti Monica Ottaviani Andrea D'Arino Mauro Truglio Lorenzo Sciuto Marco Zaccarini Alessia Pacifico Carlo Cota Paolo Iacovelli Mauro Picardo	Vitiligo is an acquired skin depigmentation disease involving multiple pathogenetic mechanisms, which ultimately direct cytotoxic CD8^(+) cells to destroy melanocytes. Abnormalities have been described in several cells even in pigmented skin as an expression of a functional inherited defect. Keratinocytes regulate skin homeostasis by the assembly of a proper skin barrier and releasing and responding to cytokines and growth factors. Alterations in epidermal proliferation, differentiation, and...	pmid:36054352 doi:10.1126/sciadv.abn9299	Fri, 02 Sep 2022 06:00:00 -0400
24	pubmed:36054406	<a href="#">Nigakinone alleviates DSS-induced experimental colitis via regulating bile acid profile and FXR/NLRP3 signaling pathways</a>	Fangle Liu Yufeng Yao Qian Wang Fengxue Zhang Meiqi Wang Chenchen Zhu Chaozhan Lin	The correlation of bile acid (BA) metabolism disorder with the pathogenesis of ulcerative colitis (UC) is realized nowadays. Farnesoid X receptor (FXR), a controller for BA homeostasis and inflammation, is a promising target for UC therapy. Nigakinone has potential therapeutic effects on colitis. Herein, we investigated the anti-UC effects and mechanism of nigakinone in colitic animals induced by dextran sulfate sodium (DSS). The related targets involved in the nucleotide-binding oligomerization...	pmid:36054406 doi:10.1002/ptr.7588	Fri, 02 Sep 2022 06:00:00 -0400
25	pubmed:36054430	<a href="#">Immune restoration affects 10-year survival in people living with HIV/AIDS</a>	Bogusz Jan Aksak-Ws Justyna D Kowalska Piotr Zbek Karol Serwin Milena Rafalska-Kosior Joanna Gob Daniel Chober Karolina Skonieczna-ydecka Magorzata Hackiewicz Miosz Parczewski	CONCLUSIONS: Immune restoration remains a powerful factor in improving the survival of PLWH, regardless of the speed of recovery.	pmid:36054430 doi:10.1111/hiv.13391	Fri, 02 Sep 2022 06:00:00 -0400

NCT Number		Title	Authors	Description	Identifier	Dates
26	pubmed:36054683	<a href="#">Alterations of gut microbiome, metabolome and lipidome in Takayasu arteritis</a>	Luyun Fan Junru Chen Lili Pan Xiaohong Xin Bin Geng Lirui Yang Qian Wang Wenjun Ma Ying Lou Jin Bian Xiao Cui Jing Li Lu Wang Zhenzhen Chen Wenjie Wang Changting Cui Shuangyue Li Qiannan Gao Qirui Song Yue Deng Jiali Fan Jiachen Yu Huimin Zhang Yafeng Li Jun Cai	CONCLUSION: This study firstly identifies the discriminatory gut microbes in TA. Dysbiotic microbes also link to TA phenotypes directly or indirectly via metabolic and lipid modules. Further explorations on microbiome-metagenome interface in TA subtype prediction and pathogenesis are indicated.	pmid:36054683 doi:10.1002/art.42331	Fri, 02 Sep 2022 06:00:00 -0400
27	pubmed:36054758	<a href="#">Impact of dietary supplementation with N-carbamoyl-aspartic acid on serum metabolites and intestinal microflora of sows</a>	Lu-Min Gao Gang-Yi Liu Hong-Ling Wang Teketay Wassie Xin Wu Yu-Long Yin	BACKGROUND: N-carbamyl aspartic acid (NCA) is a critical precursor for de novo biosynthesis of pyrimidine nucleotides. To investigate the cumulative effects of maternal supplementation with NCA on the productive performance, serum metabolites and intestinal microbiota of the sows, forty pregnant sows (d 80) were assigned into two groups: (1) the control (CON) and (2) treatment (NCA, 50g t <sup>-1</sup> NCA).	pmid:36054758 doi:10.1002/jsfa.12186	Fri, 02 Sep 2022 06:00:00 -0400
28	pubmed:36054767	<a href="#">Longitudinal associations of plasma metabolites with persistent fatigue among colorectal cancer survivors up to 2years after treatment</a>	Eline H van Roekel Martijn J L Bours Stéphanie O Breukink Michèl Aquarius Eric T P Keulen Audrey Gicquiau Sabina Rinaldi Paolo Vineis Ilja C W Arts Marc J Gunter Michael F Leitzmann Augustin Scalbert Matty P Weijenberg	The underlying biological mechanisms causing persistent fatigue complaints after colorectal cancer treatment need further investigation. We investigated longitudinal associations of circulating concentrations of 138 metabolites with total fatigue and subdomains of fatigue between 6 weeks and 2 years after colorectal cancer treatment. Among stage I-III colorectal cancer survivors (n = 252), blood samples were obtained at 6 weeks, and 6, 12 and 24 months posttreatment. Total fatigue and fatigue...	pmid:36054767 doi:10.1002/ijc.34252	Fri, 02 Sep 2022 06:00:00 -0400