

Erasmus University Rotterdam, the Netherlands
CSC PhD 2015 Project Description

School/Department:	<i>Department of Forensic Molecular Biology, Erasmus University Medical Center Rotterdam, Rotterdam, The Netherlands.</i>
Project Title:	<i>Developing molecular tools to improve forensic analysis by using recent advances in human molecular biology and genetics</i>
Abstract:	<p>In the past several years, the Department of Forensic Molecular Biology at Erasmus University Medical Center Rotterdam has been on the worldwide forefront in improving forensic analyses by delivering innovative fundamental research in human molecular biology and genetics with forensic relevance, and developing molecular tools for forensic applications. For instance, we initiated and further developed Forensic DNA Phenotyping, initiated trace deposition timing from circadian biomarkers, revolutionized forensic Y-chromosome analysis towards individual male identification, and improved molecular tissue identification for forensic applications.</p> <p>A successful project in the Department of Forensic Molecular Biology at Erasmus MC i) deals with an important forensic question that currently cannot be answered, ii) starts with basic molecular research, iii) discovers new scientific information, iv) uses this knowledge to develop a new molecular test system, and v) finally delivers a forensically validated tool suitable for practical application to forensic case work, which answers the forensic question of interest. The outcomes of the various steps are published in peer-reviewed journals either on general science, or biological sciences, or forensic sciences.</p> <p>The successful candidate will be taking over the results of fundamental research projects within the Department and will develop molecular tools to improve forensic analysis. This could be DNA tests for appearance and ancestry prediction in the area of Forensic DNA Phenotyping, DNA tests for forensic tissue identification to overcome limitations of current RNA-based tests, D/RNA tests to improve trace deposition timing for molecular alibi testing, and/or combined tests for various forensic purposes using massive parallel sequencing technologies (NGS).</p> <p>The successful candidate will obtain a PhD in 4 years.</p>
Requirements of candidate:	<p>Master degree: Yes</p> <p>Essential requirements: The candidate is required to have excellent background in any of the following disciplines, at best more than one: molecular biology,</p>

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	<p>molecular genetics, and genomics. The candidate is required to have excellent lab skills, very good English communication and writing skills, and good computational skills.</p> <p>Desired pluses: Knowledge in forensic genetics; Experience in dealing with large datasets; Computer programming skills; Authorship on science citation indexed (SCI) publications.</p> <p>IELTS Grade: 7.0 (<i>minimal 6.0 per component</i>) or TOEFL: 100 (<i>minimal 20 per component</i>)</p>
Supervisor information:	<p><i>The candidate will be under direct supervision by</i></p> <p><i>Professor Dr. Manfred Kayser</i> Head, Dept. of Forensic Molecular Biology, Erasmus MC P.O. Box 2040, 3000 CA Rotterdam, The Netherlands Visiting address: Wytemaweg 80, 3015 CN Rotterdam, The Netherlands, room Ee1067 Email: m.kayser@erasmusmc.nl Tel: +31 10 703 80 73 www.erasmusmc.nl www.erasmusmc.nl/fmb</p> <p><i>and</i></p> <p><i>Assistant Professor Dr. Fan Liu</i> Group leader, Dept. of Forensic Molecular Biology, Erasmus MC P.O. Box 2040, 3000 CA Rotterdam, The Netherlands Visiting address: Wytemaweg 80, 3015 CN Rotterdam, The Netherlands, room Ee1067 Email: f.liu@erasmusmc.nl Tel: +31 10 704 29 96 www.erasmusmc.nl www.erasmusmc.nl/fmb</p> <p>Selected publications related to the topic last 5 years</p> <p>1) Lech K, Ackermann K, Wollstein A, Revell VL, Skene DJ and Kayser M (2014) Assessing the suitability of miRNA-142-5p and miRNA-541 for bloodstain deposition timing. Forensic</p>

	<p>Science International: Genetics, 12:181-184, IF: 3.202, Ci: 0</p> <p>2) Ballantyne KN, Ralf A, Aboukhalid R, Achakzai NM, Anjos MJ, Ayub Q, Balažic J, Ballantyne J, Ballard DJ, Berger B, Bobillo C, Bouabdellah M, Burri H, Capal T, Caratti S, Cárdenas J, Cartault F, Carvalho EF, Carvalho M, Cheng B, Coble MD, Comas D, Corach D, D'Amato ME, Davison S, de Knijff P, De Ungria MCA, Decorte R, Dobosz T, Dupuy BM, Elmrghni S, Gliwiński M, Gomes SC, Grol L, Haas C, Hanson E, Henke J, Henke L, Herrera-Rodríguez F, Hill CR, Holmlund G, Honda K, Immel U-D, Inokuchi S, Jobling MA, Kaddura M, Kim JS, Kim SH, Kim W, King TE, Klausriegler E, Kling D, Kovačević L, Kovatsi L, Krajewski P, Kravchenko S, Larmuseau MHD, Lee EY, Lessig R, Livshits LA, Marjanović D, Minarik M, Mizuno N, Moreira H, Morling N, Mukherjee M, Munier P, Nagaraju J, Neuhuber F, Nie S, Nilasitsatoporn P, Nishi T, Oh HH, Olofsson J, Onofri V, Palo JU, Pamjav H, Parson W, Petlach M, Phillips C, Ploski R, Prasad SPR, Primorac D, Purnomo GA, Purps J, Rangel-Villalobos H, Rębała K, Rerkamnuaychoke B, Gonzalez DR, Robino C, Roewer L, Rosa A, Sajantila A, Sala A, Salvador JM, Sanz P, Schmitt C, Sharma AK, Silva DA, Shin K-J, Sijen T, Sirker M, Siváková D, Škaro V, Solano-Matamoros C, Souto L, Stenzl V, Sudoyo H, Syndercombe Court D, Tagliabracci A, Taylor D, Tillmar A, Tsybovsky IS, Tyler-Smith C, van der Gaag KJ, Vanek D, Völgyi A, Ward D, Willemse P, Yap EPH, Yong RYY, Zupanič Pajnič I, and Kayser M (2014) Towards male individualization with rapidly mutating Y-chromosomal STRs. Human Mutation, 35(8):1021-32, IF: 5.050, Ci: 0</p> <p>3) Chaitanya L, Walsh S, Andersen JD, Ansell R, Ballantyne K, Ballard D, Banemann R, Bauer CM, Bento AM, Brisighelli F, Capal T, Clarisse L, Gross TE, Haas C, Hoff-Olsen P, Hollard C, Keyser C, Kiesler KM, Kohler P, Kupiec T, Linacre A, Minawi A, Morling N, Nilsson H, Norén L, Ottens R, Palo JU, Parson W, Pascali VL, Phillips C, Porto MJ, Sajantila A, Schneider PM, Sijen T, Söchtig J, Syndercombe-Court D, Tillmar A, Turanska M, Vallone PM, Zatkáliková L, Zidkova A, Branicki W, Kayser M (2014) Collaborative EDNAP exercise on the IrisPlex system for DNA-based prediction of human eye color. Forensic Science International: Genetics, 11:241-51, IF: 3.202, Ci: 0</p> <p>4) Pośpiech E, Wojas-Pelc A, Walsh S, Liu F, Maeda H, Ishikawa T, Skowron M, Kayser M, Branicki W (2014) The common occurrence of epistasis in the determination of human pigmentation and its impact on DNA-based pigmentation</p>
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	phenotype prediction. Forensic Science International: Genetics , 11:64-72, IF: 3.202, Ci: 1
5)	Chaitanya L, van Oven M, Weiler N, Harteveld J, Wirken L, Sijen T, de Knijff P, and Kayser M (2014) Developmental validation of mitochondrial DNA genotyping assays for adept matrilineal inference of biogeographic ancestry at a continental level. Forensic Science International: Genetics , 11:39–51, IF: 3.202, Ci: 0
6)	Walsh S, Chaitanya L, Clarisse L, Wirken L, Draus-Barini J, Kovatsi L, Sijen T, de Knijff P, Branicki W, and Kayser M (2014) Developmental validation of the HlrisPlex System: DNA-based eye and hair color prediction for forensic usage. Forensic Science International: Genetics , 9:150-161, IF: 3.202, Ci: 0
7)	Liu F , Hendriks AEJ, Ralf A, Boot AM, Benyi E, Säwendahl L, Oostra BA, van Duijn C, Hofman A, Rivadeneira F, Uitterlinden AG, Drop SLS, and Kayser M (2014) Common DNA variants predict tall stature in Europeans. Human Genetics , 133(5):587-97, IF: 4.522, Ci: 0
8)	van Oven M, Toscani K, van den Tempel N, Ralf A, and Kayser M (2013) Multiplex genotyping assays for fine-resolution subtyping of the major human Y-chromosome haplogroups E, G, I, J and R in anthropological, genealogical, and forensic investigations. Electrophoresis , 34:3029–3038, IF: 3.161, Ci: 3
9)	Draus-Barini J, Walsh S, Pośpiech E, Kupiec T, Głąb H, Branicki W*, and Kayser M* (2013) Bona fide color: DNA prediction of human eye and hair color from ancient and modern skeletal remains, Investigative Genetics , 4:3, IF: -, Ci: - (not yet ISI-JRF listed)
10)	Walsh S, Liu F , Wollstein A, Kovatsi L, Ralf A, Kosiniak-Kamysz A, Branicki W, and Kayser M (2013) The HlrisPlex System for simultaneous prediction of hair and eye color from DNA. Forensic Science International: Genetics , 7:98–115, IF: 3.202, Ci: 24
11)	Lindenbergh PA, de Pagter M, Ramdayal G, Visser M, Zubakov D, Kayser M , Sijen T (2012) A multiplex (m)RNA profiling system for the forensic identification of body fluids and contact traces. Forensic Science International: Genetics , 6:565–577, IF: 3.202, Ci: 15
12)	van Oven M, van den Tempel N and Kayser M (2012) A multiplex SNP assay for the dissection of human Y-chromosome haplogroup O representing the major paternal

	<p>lineage in East and Southeast Asia. <i>Journal of Human Genetics</i>, 57:65–69, IF: 2.526, Ci: 5</p> <p>13) Ballantyne KN+, Keerl V+, Wollstein A, Choi Y, Zuniga SB, Ralf A, Vermeulen M, de Knijff P and Kayser M (2012) A new future of forensic Y-chromosome analysis: rapidly mutating Y-STRs for differentiating male relatives and paternal lineages. <i>Forensic Science International: Genetics</i>, 6:208–218, IF: 3.202, Ci: 12</p> <p>14) Ballantyne KN*, van Oven M*, Ralf A, Stoneking M, Mitchell RJ, van Oorschot RAH, and Kayser M (2012) MtDNA SNP multiplexes for efficient inference of matrilineal genetic ancestry within Oceania. <i>Forensic Science International: Genetics</i>, 6:425-436, IF: 3.202, Ci: 10</p> <p>15) Walsh S, Wollstein A, Liu F, Chakravarthy U, de Jong PTVM, Rahu M, Seland JH, Soubrane G, Tomazzoli L, Topouzis F, Vingerling JR, Vioque J, Fletcher AE, Ballantyne KN, and Kayser M (2012) DNA-based eye color prediction across Europe with the IrisPlex system. <i>Forensic Science International: Genetics</i>, 6:330–340, IF: 3.202, Ci: 16</p> <p>16) Walsh S, Lindenberg A, Zuniga SB, Sijen T, de Knijff P, Kayser M, and Ballantyne KN (2011) Developmental validation of the IrisPlex System: Determination of blue and brown iris color for forensic intelligence. <i>Forensic Science International: Genetics</i>, 5:464–471, IF: 3.202, Ci: 26</p> <p>17) van Oven M, Ralf A, and Kayser M (2011) An efficient multiplex genotyping approach for detecting the major worldwide human Y-chromosome haplogroups. <i>International Journal of Legal Medicine</i>, 125:879–885, IF: 2.597, Ci: 10</p> <p>18) Walsh S, Liu F, Ballantyne K, van Oven M, Lao O, Kayser M (2011) IrisPlex: a sensitive DNA tool for accurate prediction of blue and brown eye color in the absence of ancestry information. <i>Forensic Science International: Genetics</i>, 5:170-180, IF: 3.202, Ci: 41</p> <p>19) Van Oven M, Vermeulen M, and Kayser M (2011) Multiplex genotyping system for efficient inference of matrilineal genetic ancestry with continental resolution <i>Investigative Genetics</i>, 2:6, IF: -, Ci: - (not yet ISI-JRF listed)</p> <p>20) Visser M, Zubakov D, Ballantyne KN, Kayser M (2011) mRNA-based skin identification for forensic applications. <i>International Journal of Legal Medicine</i>, 125:253–263, IF: 2.597, Ci: 12</p>
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	<p>21) Zubakov D, Liu F, van Zelm MC, Vermeulen J, Oostra BA, van Duijn CM, Driessen GJ, van Dongen JJM, Kayser M⁺, Langerak AW⁺ (2010) Estimating human age from T cell DNA rearrangements. Current Biology, 20(22):R970, Featured in <i>Nature, Science</i>, IF: 9.916, Ci: 28</p> <p>22) Ackermann K, Ballantyne KN, Kayser M (2010) Estimating trace deposition time with circadian biomarkers: a prospective and versatile tool for crime scene reconstruction. International Journal of Legal Medicine, 124(5):387-395, IF: 2.597, Ci: 3</p> <p>23) Ballantyne KN, Goedbloed M, Fang R, Schaap O, Lao O, Wollstein A, Choi Y, van Duijn K, Vermeulen M, Brauer S, Decorte R, Poetsch M, von Wurmb-Schwark N, de Knijff O, Labuda D, Vézina H, Knoblauch H, Lessig R, Roewer L, Ploski R, Dobosz T, Henke L, Henke J, Furtado MR, and Kayser M (2010) Mutability of Y-chromosomal microsatellites: rates, characteristics, molecular bases and forensic implications. American Journal of Human Genetics, 87:341–353, Featured article, IF: 10.987, Ci: 51</p> <p>24) Zubakov D, Boersma AWM, Choi Y, van Kuijk PF, Wiemer EAC, and Kayser M (2010) MicroRNA markers for forensic body fluid identification obtained from microarray screening and quantitative RT-PCR confirmation. International Journal of Legal Medicine, 124:217-226, IF: 2.597, Ci: 56</p>
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