

# CONTRIBUTION OF FORENSIC LABORATORY TO SCIENTIFIC CRIME INVESTIGATION IN INVESTIGATING LEGAL CASE OF DRUG ABUSE: A SYSTEMATIC REVIEW

Rudy Heriyanto Adi Nugroho<sup>1</sup>

<sup>1</sup> Universitas Lampung, Indonesia

## ABSTRACT

Forensic laboratory has important role in the development of criminology science, and practically in various stages of criminal case investigation. This study seeks to systematically review the role of the forensic laboratory in criminal case investigation, particularly drug abuse in Indonesia. By using systematic review analysis, the results revealed that this role is theoretically related to the constitutional duties given by the law regarding police duties. The implementation of the role of the forensic laboratory is scientifically closely related to the Scientific Crime Investigation (SCI) model in the implementation of police duties. The results also highlight the scientific perspective of the forensic laboratory and Scientific Crime Investigation and denote the practical procedures and tasks of the forensic laboratory in criminal case investigation in Indonesia, especially its role on drug case investigation.

**Keywords:** Forensic Laboratories, Scientific Crime Investigation, Criminology, Narcotic Abuse, Systematic Review

## Correspondence:

Rudy Heriyanto Adi Nugroho  
Universitas Lampung, Indonesia

## INTRODUCTION

Indonesian Law Number 2 of 2002 concerning the State Police of the Republic of Indonesia in Article 13 describes the main duties of the national police, namely maintaining security and public order, upholding laws, providing protection, protection, and services to the community. In the stage of political action which includes investigations by the Indonesian National Police to seek material truths, the scientific crime investigation (SCI) method is known. This is in accordance with Article 14 of Law Number 2 of 2002 concerning the Indonesian National Police, which states that one of the duties of the police is to carry out investigations. Investigation is regulated in Article 1 paragraph (2) of the Criminal Procedure Code which explains that an investigation is a series of actions by an investigator in matters and according to methods regulated in this law to find and collect evidence that occurred and to find the suspect. Apart from that, it also mandates the police to carry out identification, forensic and psychology laboratories for police duties, the prisons to carry out scientific crime scenes to uncover criminal cases. In the proof system, the practice of finding things that must be checked in the laboratory first is research on substances, dirt or hair types, blood types, blood stains and so on. Investigative activities using the laboratory have been known to people since 1920. Experts who work in these laboratories usually face problems related to murder, for example, efforts to study the causes of death or about the properties of those used to kill victims or research on powders containing narcotics or types of opium or liquor and poisons. Such research will be used as a basis for prosecution and if it is able to give confidence to the judge, then based on that, the judge's decision can be passed. This proof system has been developed rapidly since 20th century (Saferstein, 2004).

In accordance with technological advances that were developing at that time, experts tried to identify and prove crimes from objects that could be found at the crime scene, in addition to the victims found.

According to O'Hara & Osterberg (1972), crime lab analysts refer to a profession and discipline that aims to identify, collect, investigate, analyze and evaluate physical evidence by applying the sciences to legal matters. Thus, physical evidence with scientific assessment is a criminology (Lee & Pagliaro, 2013). Anderson and Winfree Jr. (1987) stated that criminology is a science that can be used to seek, collect, and arrange material for judicial use (Valier, 1998; Burns et al., 2016). According to Klotter and Meier (1971), the crime laboratory is so important because not all of the defendants have confessed to what they have committed. Therefore, proof-of-evidence is carried out using expert experts who are involved in the crime laboratories, as well as experts in other fields, then expertise in the crime laboratory after attending special education then training and experience.

Given the important role of the forensic laboratory in the development of criminology science, and practically in various stages of criminal case investigation, this study seeks to systematically review the role of the forensic laboratory in criminal case investigation, particularly drug abuse. Theoretically, this role is related to the constitutional duties given by the law regarding police duties. Scientifically, the implementation of the role of the forensic laboratory is closely related to the Scientific Crime Investigation (SCI) model in the implementation of police duties. Although previous studies have discussed the contribution of forensic laboratories in criminal investigations (Julian et al., 2011; Ribaux et al., 2006; Broséus, et al., 2016; Roux et al., 2012; Rossy et al., 2013; Morelato et al., 2013), studies on the role of crime labs in particular with SCI which are practically focused on handling and investigating drug cases in Indonesia have not been widely carried out. In detail, this paper is organized systematically into several sections, starting with an introduction. The second part discusses the relationship from a scientific perspective between the forensic laboratory and Scientific Crime

## Contribution Of Forensic Laboratory To Scientific Crime Investigation In Investigating Legal Case Of Drug Abuse: A Systematic Review

Investigation (SCI). The next section, practically discusses the procedures and tasks of the forensic laboratory in criminal case investigation. The final main section discusses the role of the forensic laboratory in drug case investigation.

### SCIENTIFIC CRIME INVESTIGATION THROUGH FORENSIC SCIENCES

Forensic science includes all sciences that have to do with the problem of crime, or it can be said that in terms of its role in solving crime cases, forensic science plays an important role (Houck & Siegel, 2009; Saferstein & Hall, 2017). All sciences related to the problem of crime are involved in criminal law, criminal procedure law, forensic medicine and forensic psychology and psychiatry and forensic neurology (Silva, 2009; Neal & Grisso, 2014; Moenssens et al., 2007). A forensic laboratory was formed to assist the investigation process by examining evidence of a criminal act that occurred. The forensic laboratory acts as an auxiliary facility in the investigation process and carries out its duties, namely, examining evidence if there is a request for examination. If there is no request for examination of evidence, the forensic laboratory is not authorized to conduct an examination even though the evidence is available. Bearing in mind that in the process of investigation, to reveal a criminal act it is not absolutely necessary to refer to the testimony of the witness and the testimony of the suspect or defendant, but it is also important and can even help reveal a criminal act by examining evidence.

Identification according to criminology is aimed at the basic theory that all objects can be divided and then subdivided into subs based on the state of the object. This means whether an object becomes a part or subsection of something. Fingerprints, marks, marks, bloodstains, hair, scratches and so on can be classified. For example, at the crime scene, there are these parts, so this can be very valuable material, where the parts or subsections come from. Therefore it can be said that criminology is related to the state or origin of something. If there is blood, then the criminalist is faced with a question that must be answered, where did the blood come from. If a bullet is found in the victim's body, the expert must answer which gun it came from and which weapon. If a piece of bone is human or animal bone, and if it is confirmed that it is a human bone, and then it is checked how old the person is, all these are useful for identification. This identification through physical evidence often makes it very difficult for suspects to escape or defend themselves.

This laboratory examination will help reveal a criminal act that has occurred, because this evidence cannot lie, while the evidence in the form of witness testimony and the statement of the suspect or defendant may lie or be ordered to lie. This is in accordance with the opinion of Perdanakusuma (1984) that not all crimes were witnessed by eyewitnesses; eyewitnesses can lie or be told to lie; and, an unlimited amount of physical evidence that cannot lie or be compelled to lie because of its nature and physical evidence.

The next goal of the forensic laboratory is for criminals and the public. Therefore, no matter how carefully committed the crime, the possibility of evidence remains. This evidence will be examined in laboratories by the forensic laboratory. Here, the crime that is revealed through the examination of evidence,

psychologically, people will think that they will commit a crime. With the effective functioning of the forensic laboratory, the community will experience development in the sense of developing behavior in society. Thus, the legal order in the process of development is expected to be gradually reflected in the souls of individuals as members of society.

### FORENSIC LABORATORIES IN INDONESIA

Forensics can be interpreted as the result of examinations needed in the judicial process. Pramusinto (1984) defines forensics as a science that uses multi-disciplinary science to apply natural sciences, chemistry, medicine, biology, psychology and criminology with the aim of making light to prove the existence of a crime/violation case by examining the evidence or physical evidence in the case. The definition of a forensic laboratory as referred to in this paper is an implementation of the high center of the National Police Headquarters in the form of an agency assigned and obliged to carry out a criminalistics function and carry out all service efforts and activities to assist in proving a criminal act that has occurred using technology and medical science justice, forensic science, forensic chemistry and other supporting sciences. Based on this definition, the forensic laboratory is one of the police functions which are an element of criminalistics laboratory technical assistance in the context of police duties as investigators. The implementation of its duties includes technical laboratory inspection assistance for evidence and crime scenes as well as other assistance activities for operational elements, especially investigators. Forensic laboratories have been known in Indonesia since 1920, where identification and forensic laboratories are combined into one called the Laboratory and Identification Institute. Then in 1964 it was separated separately between the forensic laboratory and identification. As for the forensic laboratory that we know today, previously used a crime laboratory but based on warrant No. Pol: Sprin/295/II/1993 regarding the validation of the National Police Organization issued on February 7, 1993 by the head of the Indonesian police, so since then the name Police Crime laboratory has become the Police Forensic Laboratory.

The Forensic Laboratory provides services for Law Enforcement Officials and the general public who need public examination/services to get a sense of justice and/or other needs.

#### a. Forensic Documents and Counterfeit Money Sector (Indonesian abbrev: *Biddokupalfor*)

In charge of organizing crime scene technical inspection services and criminalistics laboratory examinations of documentary evidence (handwritten, typewritten, and signature), counterfeit money (Indonesian banknotes, foreign banknotes, and coins) and printed products (conventional printed products, digital printing and optical discs) and provide general criminalistics forensic services.

#### b. Ballistics and Forensic Metallurgy (Indonesian abbrev: *Bidbalmeffor*)

In charge of carrying out crime scene technical inspection services and criminalistics laboratory examinations of evidence of firearms (firearms, bullets and bullet casings), explosives (explosives, bomb components, and post blast bombs) and metallurgy (proof number series, metal damage),

## Contribution Of Forensic Laboratory To Scientific Crime Investigation In Investigating Legal Case Of Drug Abuse: A Systematic Review

- and construction accidents as well as providing general criminalistics forensic services.
- c. Physics and Computer Forensics (Indonesian abbrev: *Bidfiskomfor*)  
In charge of organizing crime scene technical inspection services and criminalistics laboratory examinations for evidence of lie detector, traces, radioactivity, building construction, engineering equipment, fire/arson and computers (sound and images (audio/video)), computers & mobile phones (computer & mobile phones) and internet/intranet (cyber network) crime as well as providing criminal forensic general services.
  - d. Chemistry, Toxicology, and Forensic Biology (Indonesian abbrev: *Bidkimbiofor*)  
In charge of organizing crime scene technical inspection services and criminalistics laboratories for chemical evidence (unknown materials, industrial chemicals), biology/serology (serology, molecular biology, and biological materials) and toxicology or the environment life (toxicology, microorganisms, and environmental pollution), as well as providing general criminalistics forensic services.
  - e. Narcotics, Psychotropic and forensic dangerous drugs (Indonesian abbrev: *Bidnarkobafor*)  
In charge of organizing crime scene technical examination services and criminalistics laboratory examinations for evidence of narcotics (natural substances narcotics, synthetic & semi-synthetic materials, body fluids), psychotropic (psychotropic substances & preparations, illegal laboratories (clandestine labs), psychotropic substances), and drugs (dangerous drug chemicals, addictive chemicals, precursors), as well as providing general criminalistics forensic services.

### CONTRIBUTION OF FORENSIC LABORATORY IN CRIMINAL INVESTIGATION STAGES

In general, forensic laboratories within police institutions in Indonesia present the results of forensic laboratory examinations. The types of services for the Police Forensic Laboratory are presented in the form of inspection products for the National Police Forensic Laboratory which are categorized according to their interests which can be divided into judicial and non-judicial interests. In the interests of the judiciary, this type of service is only provided at the request of law enforcement officials (police, prosecutors, judges, military police corps, civil servant investigators and other related agencies) in the framework of law enforcement processes (investigation, prosecution and judiciary stage) for a criminal case in the form of an official report on the technical criminalistics examination of the Crime scene and the criminalistics laboratory examination of evidence. Meanwhile, for non-judicial interests, this type of service can be provided to/requested by the community in the context of enforcing internal group/community rules or to reduce conflicts or for therapeutic purposes. This is usually done for a civil case, case in the household or for therapeutic purposes if there is a suspicion that a family member is suspected of being involved in drugs in the form of a test sample examination certificate.

For the procedure for requesting an examination as a procedure that must be taken to obtain a Forensic Laboratory examination, it must meet the requirements in a laboratory in several aspects: the existence of an

inspection request letter, police report, minutes of confiscation of evidence, records of wrapping and sealing of evidence and *visum et repertum* if there are victims of injury or death.

- a. Examination Request Letter  
This request letter is addressed to the Head of the Forensic Laboratory with the intention of obtaining a laboratory examination from the Forensic Laboratory by explaining the purpose and purpose of the examination in writing. Requests for criminalistics laboratory examination of evidence can be fulfilled based on written requests from the police, prosecutors, judges, military police corps, civil servant investigators and other relevant agencies.
- b. Police Report  
A police report is a report concerning a situation or event of a criminal act that occurs in connection with the taking of the evidence. This report describes a situation or situation at the time of taking evidence, for example the place where the suspect and evidence were first found which is called the first crime scene. Sometimes these locations do not stand alone, in cases like this other than the crime scene there are other locations where other evidence can be found such as storage places for large amounts of goods (drugs), tools used in committing crimes, and other places that need and sometimes often provide a great deal of information to assist in the evidence search process.
- c. Minutes of Confiscation of Evidence  
If the evidence is in a large enough quantity, then for laboratory inspection it is sufficient to take only a few parts which are used as samples which are deemed to represent the entire evidence. Therefore, if the evidence is 10 kg, for examination, it is certainly a bit difficult to do because it is enough to just take a few pieces of the evidence for laboratory examination. Provision for evidence is made in the form of an official report on the provision for evidence.
- d. Minutes of Wrapping and Sealing of Evidence  
This report of wrapping is carried out after there is evidence, where this report of wrapping contains information explaining all actions taken by officers in the field. In the framework of wrapping evidence, wrapping is carried out with the aim of securing it in the next examination process. The evidence that has been wrapped is then sealing the evidence, this is done to maintain the purity and safety of the evidence which will be sent to the forensic laboratory for further examination.
- e. *Visum Et Repertum* in Victims of Injury or Death  
*Visum et repertum* is a written report from a doctor who has been sworn in on what was seen and found in the evidence he examined and also contains the conclusions of the examination for the benefit of the judiciary. In a judicial process starting from an investigation at the scene of the incident until the trial in court, it is the evidence that plays the main role. Living or dead human bodies can be evidence and will be shown to the judge who will hear the case. However, the human body is dead and the evidence that is obtained certainly cannot provide testimony, this requires the knowledge of Justice Medicine and Forensic Officers who will later provide answers or reports on the results of examinations of

## Contribution Of Forensic Laboratory To Scientific Crime Investigation In Investigating Legal Case Of Drug Abuse: A Systematic Review

suspects, victims, and evidence that has been checked.

Furthermore, the forensic process will start from beginning to end with several main stages: investigation, prosecution, examination, completion and submission of files, prosecution and trial stages. In these various processes, it will be clearly seen the role of the forensic laboratory in solving criminal cases. First, in the investigation process. The investigator has the authority to seek information and evidence, besides that the investigator together with the investigator who has received the report will immediately come to the crime scene and prohibit everyone from leaving that place while the examination is not yet finished. In the context of handling this crime scene, both investigators and investigators try to find evidence, which will later be examined at the forensic laboratory. To recognize, seek, retrieve and collect evidence requires accuracy, precision and knowledge or expertise regarding the material or evidence, because this stage needs to be involved by the forensic laboratory. For example, in cases of falsification of industrial products, fire, murder, explosives and cases of narcotics abuse, where the evidence is often micro, the success of discovery and examination is highly dependent on the technology used.

Second, is the action stage. One of the prosecution activities is to confiscate evidence or objects related to the criminal act that has occurred, in the event of confiscation of objects or goods that are dangerous and easily contaminated or their collection requires special equipment or handling, technical support from the forensic laboratory is required to handle the evidence. Thus, it is hoped that the evidence which will be examined at the forensic laboratory will not change or be contaminated so that the results of the examination are in accordance with the original nature of the evidence. The role of the forensic laboratory in terms of action is very necessary, namely in taking evidence or sampling as well as securing or preserving evidence to be examined at the forensic laboratory.

Third, is the Inspection Stage. The examination stage is an activity to obtain information, clarity and identity of the suspect and witnesses or evidence so that the position or role of a person or evidence in the crime becomes clear. One of the activities at the examination stage related to the forensic laboratory, among others, is that the investigator can ask the opinion of an expert or person with special expertise. As long as the opinion of the expert requested by the investigator is related to evidence, the expert will conduct an examination or analysis of the evidence at the laboratory. For example, examining the content of active substances in narcotics, as such examination requires the use of science and technology owned by the forensic laboratory.

Fourth, is the stage of completion and submission of files. This stage is the final stage of the investigation process in which the investigator has finished carrying out the investigation, the investigator is obliged to immediately submit the case file to the public prosecutor. The composition of the files includes, among others, minutes of expert examination regarding evidence. Thus the role of the forensic laboratory at this stage is to make an examination

report regarding evidence by the crime laboratory and submit it to the investigator.

Fifth, is the Prosecution Stage. In the case of the prosecution process, the public prosecutor can consult with an expert examiner from the forensic laboratory regarding the results of the crime laboratory examination, so that the criminal element is being charged becomes more accurate. In addition, if the prosecutor carries out an investigation into a special criminal case, the prosecutor as an investigator can send evidence to be examined by an expert at the forensic laboratory.

Sixth, is the Judicial Stage. According to Criminal Procedure Code Article 184 paragraph 1, there are 5 valid means of evidence, namely witness testimony; expert statement; letter; instructions; and the statement of the defendant. Of the five pieces of evidence mentioned above, 3 of them, namely expert statements, letters and instructions may come from the police forensic laboratory products based on the examination of evidence in the laboratory.

### FORENSIC LABORATORY EXAMINATION FOR NARCOTICS CASES

In general, plants belonging to the narcotics group are marijuana, coca/cocaine and *Papaver somniferum*/opium poppy. Marijuana (*Cannabis indica*) is a plant that thrives in our country, both in the lowlands and in the highlands. This plant can grow to a height of 2 meters, if this plant is squeezed with your fingers it will have a distinctive and refreshing smell. Furthermore, coca/cocaine (*Erythroxylum coca*) is an addictive substance that is often misused and is a dangerous substance. Cocaine is an alkaloid obtained from the shrub *Erythroxylum Coca*. Finally, *Papaver somniferum*, the type of plant used is the sap obtained from the fruit that is about to ripen, the sap that comes out is white. This sap is allowed to dry on the surface of the fruit so that it is blackish brown and after processing it will become dough that resembles soft asphalt, this is called raw opium or coarse opium. Raw opium contains many active substances which are often abused, while cooking opium has a dark brown color which is used by smoked.

In cases of drug abuse, the forensic laboratory's first task is to find evidence. This process begins with the search for evidence of this type of marijuana, namely by looking at its shape such as in the form of stalks, leaves, flowers and fruit packed in small plastic or large packages. Not infrequently, it is also in the form of cigarettes mixed with tobacco, in a form that has been refined so that it is a compact item with a greenish color, or in the form of an extract from the cannabis plant in the form of cannabis oil in a thick, thick form with a blackish brown color and a typical smell. Furthermore, from the Coca species where this type of plant is traded, it is dried leaves that have been processed to extract their juice. As for the *Papaver Somniferum*, this type of plant in its trading form is opium which consists of raw opium and cooking opium.

The second task is the collection of evidence. If the evidence is in the form of plants, then what are taken as plant evidence are the roots, stems, stalks, leaves and fruit. Furthermore, it is dried first so that in shipping it does not experience decay or damage, then after drying it is packaged in a way that is if it is too long it can be cut into two or three parts, then stored in a folder or stapled with paper then put into a carton, then wrapping it is done. This applies to all evidence in

## Contribution Of Forensic Laboratory To Scientific Crime Investigation In Investigating Legal Case Of Drug Abuse: A Systematic Review

the form of plants. If the evidence is in the form of narcotics originating from plants, about 50 grams will be taken, but if the amount is large enough then it is taken from the upper, middle and lower surface. Then placed in a clean container and try to use a new plastic bag. Each part taken is placed into a separate container and labeled.

The third task is securing/wrapping evidence. For security purposes, the collection of evidence items is placed in a container that is strong enough that it is not easily damaged when it is in transit and delivery. After being put in a good container, it is also properly wrapped and tied with a rope that is strong enough to have a seal on each strap.

The fourth task is delivery of evidence, in addition to a request for assistance for laboratory inspection which contains delivery of evidence and a police report is also attached, if the evidence is representative (representing a larger number), the total number of the evidence shall also be included in the report on the collection/collection of the evidence. Attachments also include minutes of sealing evidence and minutes of wrapping evidence and clear letters of request for laboratory inspection.

Here, various processes in the investigation and settlement of criminal cases are closely related to the role and function of the Forensic Laboratory. This clearly demonstrates the role of the forensic laboratory under Law No. 22 of 2002 concerning the National Police of the Republic of Indonesia, namely Article 14 paragraph 1 letter H, has the main task of carrying out police identification, police medicine, police forensic and psychology laboratories for the benefit of police duties. This task is the basis for carrying out the criminalistics/forensic technical functions of laboratory examinations which include chemistry, narcotics, toxicology, biology, physics, ballistics, metallurgy and forensic documents and counterfeits and demonstrates the important function of the forensic laboratory in scientific examinations for prosecution and judicial purposes in drug abuse cases in Indonesia.

### CONCLUSION

In general, the forensic laboratory plays a very effective role in solving cases in general as a place to examine evidence in a forensic laboratory for the purpose of investigating criminal acts, especially narcotics. Furthermore, the role of the forensic laboratory is very important in determining the content of these types of narcotics. From the results of forensic laboratory tests, it can be seen that the narcotics category is from their womb. After knowing the narcotics category, the results of the investigation by the investigator can determine which articles are suspected for the suspects or defendants of narcotics abuse. Examinations carried out through the forensic laboratory have a very large influence in supporting judges' convictions, in assisting judges in deciding a case. Here, it is very clear that labor plays an important role in the evidentiary system or as evidence in court.

However, in carrying out its duties and functions, the forensic laboratory is inseparable from obstacles. For example, in a letter requesting an examination, it is often unclear the purpose and purpose of the examination, often the formal requirements are not fulfilled in the form of completeness of administrative documents and material requirements in the form of insufficient amount of evidence to be examined, or

evidence is damaged due to a gradual inspection so that it slows down laboratory inspection process.

### REFERENCES

1. Anderson, P. R., & Winfree Jr, L. T. (Eds.). (1987). *Expert witnesses: Criminologists in the courtroom*. SUNY Press.
2. Broséus, J., Rhumorbarbe, D., Mireault, C., Ouellette, V., Crispino, F., & Décary-Héту, D. (2016). Studying illicit drug trafficking on Darknet markets: structure and organisation from a Canadian perspective. *Forensic science international*, 264, 7-14.
3. Burns, K., Dioso-Villa, R., & Rathus AM, Z. (2016). Judicial decision-making and 'outside'extra-legal knowledge: breaking down silos. *Griffith Law Review*, 25(3), 283-290.
4. Houck, M. M., & Siegel, J. A. (2009). *Fundamentals of forensic science*. Academic Press.
5. Julian, R. D., Kelty, S. F., Roux, C., Woodman, P., Robertson, J., Davey, A., ... & White, R. (2011). What is the value of forensic science? An overview of the effectiveness of forensic science in the Australian criminal justice system project. *Australian Journal of Forensic Sciences*, 43(4), 217-229.
6. Klotter, J. C., & Meier, C. L. (1971). *Criminal evidence for police* (Vol. 3). WH Anderson Co.
7. Lee, H. C., & Pagliaro, E. M. (2013). Forensic evidence and crime scene investigation. *Journal of Forensic Investigation*, 1(2), 1-5.
8. Moenssens, A. A., DesPortes, B. L., & Edwards, C. N. (2007). *Scientific evidence in civil and criminal cases* (pp. 111-191). New York, NY: Foundation Press.
9. Morelato, M., Beavis, A., Tahtouh, M., Ribaux, O., Kirkbride, P., & Roux, C. (2013). The use of forensic case data in intelligence-led policing: the example of drug profiling. *Forensic science international*, 226(1-3), 1-9.
10. Neal, T. M., & Grisso, T. (2014). Assessment practices and expert judgment methods in forensic psychology and psychiatry: An international snapshot. *Criminal Justice and Behavior*, 41(12), 1406-1421.
11. O'Hara, C. E. & Osterberg, J. W. (1972). Determining speed in Motor Vehicle Accidents, in *An Introduction to Criminalistics* (pp.310-346). Bloomington/London: Indiana University Press
12. Perdanakusuma, M. (1984). *Bab-bab tentang kedokteran forensik*. Ghalia Indonesia.
13. Pramusinto, S. (1984). *Himpunan Karangan Ilmu Forensik Suatu Sumbangan Bagi Wiyata Bhayangkara*. Jakarta: Karya Unipres.
14. Ribaux, O., Walsh, S. J., & Margot, P. (2006). The contribution of forensic science to crime analysis and investigation: forensic intelligence. *Forensic science international*, 156(2-3), 171-181.
15. Rossy, Q., Ioset, S., Dessimoz, D., & Ribaux, O. (2013). Integrating forensic information in a crime intelligence database. *Forensic science international*, 230(1-3), 137-146.
16. Roux, C., Crispino, F., & Ribaux, O. (2012). From forensics to forensic science. *Current Issues in Criminal Justice*, 24(1), 7-24.
17. Saferstein, R. (2004). *Criminalistics: An*

*Contribution Of Forensic Laboratory To Scientific Crime Investigation In Investigating  
Legal Case Of Drug Abuse: A Systematic Review*

- introduction to forensic science. Prentice Hall.
18. Saferstein, R., & Hall, A. B. (Eds.). (2017). *Forensic Science Handbook, Volume I*. CRC Press.
  19. Silva, J. A. (2009). Forensic psychiatry, neuroscience, and the law. *Journal of the American Academy of Psychiatry and the Law Online*, 37(4), 489-502.
  20. Valier, C. (1998). True crime stories: Scientific methods of criminal investigation, criminology and historiography. *The British Journal of Criminology*, 38(1), 88-105.