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Dear Client, we are pleased to present this Intellectual Property (IP) Analysis Report to help keep you informed of potentially impactful developments in the patent landscape.

**Report for the Subject file: WO2025012350A1.pdf**

**Title: Rna containing modified nucleosides and methods of use**

**Date range filter:** After: 2018-01-01 Before: 2025-01-28 **CPCs Used:** C12N15/11, C12N15/11, C12N15/11, A61K48/00, C12N15/11, A61K48/00 **Number of Top Patents for Claims Breakdown:** 150

**Inventor:** Katalin Kariko, Drew Weissman **Filing Date:** 2007-03-01 **Priority Date:** **Priority** to EP19168984.3A 2006-08-21 **Publication Date:** 2007-03-01

**Overall**, the patent provides a detailed framework for overcoming two major obstacles in RNA-based therapeutics—the innate immunogenicity of exogenous RNA and the often suboptimal translation efficiency—thereby facilitating the development of effective RNA therapies for a broad range of medical conditions.

**Modified RNA Composition:** The invention provides RNA molecules that are synthesized to include modified nucleosides—most notably pseudouridine but also other modifications such as m5C, m5U, m6A, S2U, and 2′‑O‑methyl‑U.

**Reduction of Immunogenicity:** A key advantage of the modified RNA molecules is their reduced capacity to trigger the innate immune response.

**Enhanced Translation Efficiency:** The modified RNA not only shows lower immunogenicity but also exhibits enhanced translation.

**Methods of Synthesis:** The patent describes protocols for in vitro transcription using phage RNA polymerases (T7, SP6, or T3) in which one or more of the standard ribonucleoside triphosphates is replaced by a corresponding modified nucleotide triphosphate. This method reliably yields RNA molecules with the desired modifications without affecting the integrity of the transcript.

**Delivery and Therapeutic Applications:** In addition to synthesis, the patent outlines formulations (including complexation with lipid-based transfection reagents or encapsulation in nanoparticles) for delivering the modified RNA into cells and tissues.

**Broad Claims:** The claims of the patent cover the compositions (modified mRNA, oligoribonucleotides, gene-therapy vectors) as well as methods of reducing RNA immunogenicity and enhancing its translation. They also extend to specific therapeutic methods such as inducing protein production in target cells, treating various diseases by administering the modified RNA, and optimizing RNA stability and expression profiles in vivo.

**Accession:** WO2007024708A2 patent document contains a reference to an "accession" related to the nucleotide sequence associated with human TLR3. Specifically, the document mentions the accession number **NM\_003265** for a gene segment involved in the experimental details. The accession is connected to a sequence encoding shRNA with 20-nt-long homology to human TLR3

-------------------------------------------------------------------------------------------------------------------**Subject Description Overview:**

The Subject invention focuses on a vector for use in the treatment and/or prevention of PRRSV infection, utilizing a viral expression cassette that includes a cDNA of an attenuated PRRSV virus genome operably linked to a promoter. The primary function is to provide a medicament, specifically a vaccine, that effectively prevents or treats PRRSV infection in pigs. The underlying functions involve the administration of the vector to induce an immune response against PRRSV, with the vector designed to be safe and effective, as evidenced by the absence of increased rectal temperature post-challenge and reduced clinical symptoms and viremia compared to existing vaccines.

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**COMPARED FILES FOLLOW: >>>>>**

**Compared file: US9981033B2**PRRSV minor protein-containing recombinant viral vectors and methods of making and use thereof
**Inventor: MEBATSION TESHOME
Assignee: MERIAL INC
Priority Date: 06-23-2015
Publication Date: 05-29-2018
CPC: A61K39/12
IPV™ Rating: 6.9928
Inferred Equivalence: Medium**

[Lens: https://www.lens.org/lens/patent/101-699-161-310-581/frontpage?l=en](https://www.lens.org/lens/patent/101-699-161-310-581/frontpage?l=en)

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The primary function of the Compared invention is to provide a safe and effective immunological or vaccine composition against Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) using recombinant viral vectors, specifically adenovirus 5 (Ad5) vectors, to express PRRSV antigens such as gp2, gp3, gp4, and E. This composition aims to induce a broad immunity, including humoral, cellular, and mucosal responses, and is designed to be compatible with the DIVA strategy, allowing differentiation between infected and vaccinated animals.

-------------------------------------------------------------------------------------------------------------------**Summary of Analysis:**

There is an overall moderate possibility of overlap between the 'Subject' and 'Compared' claims, primarily due to the shared focus on using vectors for PRRSV vaccination. However, the detailed molecular and chemical constituents and processes differ significantly. The 'Subject' claims emphasize the structure of the vector, including the use of a cDNA of an attenuated RNA virus genome and specific administration methods, while the 'Compared' claims focus on specific PRRSV antigens and the use of different recombinant vectors. This distinction in molecular details suggests that while there is a thematic overlap, the specific implementations and technologies used in each set of claims are distinct, leading to a moderate level of anticipated overlap in the patent context.

-------------------------------------------------------------------------------------------------------------------**Description Overview:**

The core concept of the Compared invention involves the use of recombinant adenovirus vectors to deliver and express specific PRRSV antigens. The functional principles include the systemic delivery of the vector to the host, where the viral expression cassette within the vector, containing the cDNA encoding PRRSV antigens, is operably linked to a promoter to facilitate expression. The underlying functions involve the induction of an immune response through the expression of these antigens, which are essential components for triggering both humoral and cellular immunity. The core interactions occur between the expressed antigens and the host's immune system, leading to the production of antibodies and activation of T-cells. Internally, the dynamics involve the transcription and translation of the antigen-encoding genes within the host cells, leading to the presentation of antigens on the cell surface for immune recognition. No specific molecular or chemical constituents are detailed beyond the use of adenovirus vectors and PRRSV antigens, and no Genbank or Accession numbers are provided.

-------------------------------------------------------------------------------------------------------------------**Asserted Novelty and Innovation:**

The Subject invention introduces novelty through the use of an attenuated PRRSV genome within the vector, which has demonstrated effectiveness in preventing PRRSV infection without causing adverse effects such as increased rectal temperature post-challenge. This contrasts with the Compared invention, which uses recombinant adenovirus vectors to express specific PRRSV antigens. The Subject invention's approach of using the entire attenuated genome rather than specific antigens may provide broader immunity and potentially more effective protection against various PRRSV strains. The overlap between the two inventions lies in their aim to combat PRRSV infection through vaccination, but the Subject invention's use of an attenuated whole genome vector represents a distinct approach from the antigen-specific recombinant vector strategy of the Compared invention. Molecularly, the Subject invention involves the entire attenuated PRRSV genome, while the Compared invention focuses on specific PRRSV antigens, indicating a significant difference in their molecular constituents and processes.

-------------------------------------------------------------------------------------------------------------------**Similarities Analysis:**

The claims from 'Subject' and 'Compared' both focus on vectors used in the context of vaccines or immunological compositions targeting Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), which is a member of the Arteriviridae family. The 'Subject' claims describe a vector comprising a viral expression cassette with a cDNA of an attenuated RNA virus genome, specifically mentioning PRRSV in several claims. The 'Compared' claims detail a composition with recombinant viral vectors encoding specific PRRSV antigens (gp2, gp3, gp4, and E). Both sets of claims mention the use of vectors for vaccination or treatment against PRRSV, indicating a thematic overlap. However, the 'Subject' claims focus more on the structure and administration of the vector, while the 'Compared' claims emphasize specific antigen sequences and the use of different types of vectors like adenovirus, baculovirus, and others. There is a notable semantic similarity in the use of vectors for PRRSV, but the molecular details and specific constituents differ significantly between the two sets of claims.

-------------------------------------------------------------------------------------------------------------------**Overlap Analysis:**

The overlap between the 'Subject' and 'Compared' claims is primarily thematic, centered around the use of vectors for PRRSV vaccination. The 'Subject' claims describe a broader approach to vector design and administration, including the use of a bacterial artificial chromosome (BAC) and an inducible bacterial origin of replication, which are not mentioned in the 'Compared' claims. Conversely, the 'Compared' claims focus on specific PRRSV antigens and the use of various recombinant vectors, which are not detailed in the 'Subject' claims. While there is a thematic overlap in the use of vectors for PRRSV, the molecular and chemical constituents and processes described are distinct, leading to a moderate level of overlap.

-------------------------------------------------------------------------------------------------------------------**Sequence Data:**Sequence Count: 139
Sequence Types: P, N
Organisms: 'Porcine reproductive and respiratory syndrome virus', 'PRRSV VR2332', 'Unknown/Artificial'
Bucket: NT\_1\_100, AA\_51\_300, NT\_5001\_100000, AA\_1\_50, NT\_101\_5000

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**Claims Breakdown and Comparison Summary:
Compared Patent (US9981033B2) Claim number: 1 and Subject Claim: 14**

Both claims focus on compositions for use as vaccines or immunological agents against PRRSV. The Compared claim specifies the use of recombinant viral vectors encoding specific PRRSV antigens (gp2, gp3, gp4, and E), while the Subject claim describes a broader approach with a vector containing an attenuated RNA virus genome from the Arteriviridae family. The scope of the Compared claim is narrower, focusing on specific antigens, whereas the Subject claim's scope is broader, encompassing any attenuated RNA virus from the Arteriviridae family. The similarity lies in their use as vaccines, but the Subject claim's approach is more general and could potentially include the specific antigens mentioned in the Compared claim.

------------------------------------------------------------------------------------------------------------------- **Compared Patent (US9981033B2) Claim number: 2 and Subject Claim: 14**

Both claims describe pharmaceutical compositions that include a vector and a carrier, intended for use as vaccines. The Compared claim specifies the use of specific types of recombinant vectors (Ad5-PRRSV, baculovirus, porcine cytomegalovirus, or poxvirus vectors), while the Subject claim is more general, mentioning a vector with an attenuated RNA virus genome from the Arteriviridae family. The scope of the Compared claim is narrower due to the specific vector types, whereas the Subject claim's scope is broader, potentially encompassing the vectors mentioned in the Compared claim. The similarity is in their use as vaccines and the inclusion of a carrier, but the Subject claim's approach is more general.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***Compared file: EP3313864B1**PRRSV MINOR PROTEIN-CONTAINING RECOMBINANT VIRAL VECTORS AND METHODS OF MAKING AND USE THEREOF
**Inventor: MEBATSION TESHOME
Assignee: BOEHRINGER INGELHEIM ANIMAL HEALTH USA INC
Priority Date: 06-23-2015
Publication Date: 07-28-2021
CPC: C07K14/08
IPV™ Rating: 6.9589
Inferred Equivalence: Medium**

[Lens: https://www.lens.org/lens/patent/129-303-468-794-616/frontpage?l=en](https://www.lens.org/lens/patent/129-303-468-794-616/frontpage?l=en)

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The primary function of the Compared invention is to provide a safe and effective immunological or vaccine composition for eliciting a protective immune response against Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in animals, particularly pigs. This is achieved through the use of one or more recombinant viral vectors that express multiple PRRSV antigens from a single vector, aiming to induce both humoral and cell-mediated immune responses.

-------------------------------------------------------------------------------------------------------------------**Summary of Analysis:**

There is an overall moderate possibility of overlap between the 'Subject' and 'Compared' patents, primarily due to the shared focus on using vectors for PRRSV vaccine development. However, the specific molecular and chemical constituents and processes described in the claims differ significantly. 'Subject' claims utilize a broader approach with a cDNA of an attenuated RNA virus genome and a bacterial artificial chromosome, while 'Compared' claims are more specific, focusing on recombinant Ad5-PRRSV vectors expressing multiple PRRSV antigens with high sequence identity to specified sequences. The detailed methodologies and components, such as the use of BACs and specific antigen expression, indicate distinct approaches to achieving the same goal of PRRSV vaccine development. Therefore, while there is some overlap in the general context, the detailed molecular and chemical processes suggest a low possibility of significant overlap in the patent claims.

-------------------------------------------------------------------------------------------------------------------**Description Overview:**

The Compared invention utilizes recombinant Ad5-PRRSV vectors to express PRRSV antigens such as gp2, gp3, gp4, and E, and optionally gp5a and gp5. These vectors contain heterologous polynucleotides encoding these antigens, which are operably linked to promoter elements and optionally enhancers to facilitate expression. The systemic principle involves the administration of these vectors to induce an immune response, with the antigens being processed and presented to the immune system to trigger specific immune responses. The foundational process includes the transcription and translation of the viral antigens within the host cells, leading to the production of viral proteins that stimulate the immune system. Essential components include the Ad5 vector, the PRRSV antigen-encoding polynucleotides, and the pharmaceutically or veterinarily acceptable carrier. Core interactions involve the interaction of the expressed antigens with the host's immune cells, leading to the activation of B and T cells. Internal dynamics include the cellular uptake of the vector, antigen processing, and the subsequent immune response cascade. The molecular and chemical constituents primarily involve the nucleic acids (DNA) encoding the antigens and the proteins produced from these sequences. No specific Genbank or Accession number is mentioned in the patent.

-------------------------------------------------------------------------------------------------------------------**Asserted Novelty and Innovation:**

The Subject invention introduces novelty through the use of an attenuated RNA virus genome from the Arteriviridae family, specifically designed to be used in a vaccine composition. This differs from the Compared invention, which uses recombinant Ad5 vectors expressing multiple PRRSV antigens. The Subject invention focuses on the use of a single attenuated virus genome, potentially offering a broader immune response due to the inclusion of the entire viral genome, whereas the Compared invention targets specific antigens. The overlap between the two inventions lies in their aim to combat PRRSV, but the molecular and chemical constituents differ significantly; the Subject uses an attenuated viral genome, while the Compared uses specific antigen-encoding polynucleotides. The Subject's approach may provide a more comprehensive immune response, potentially reducing the risk of viral shedding and increasing the effectiveness against various PRRSV strains compared to the targeted antigen approach of the Compared invention.

-------------------------------------------------------------------------------------------------------------------**Similarities Analysis:**

The claims from 'Subject' and 'Compared' show similarities in the context of using vectors for vaccine development against PRRSV, a virus from the Arteriviridae family. Both sets of claims mention the use of vectors for the treatment or prevention of PRRSV infections, specifically targeting pigs. 'Subject' claims focus on a vector comprising a cDNA of an attenuated RNA virus genome, operably linked to a promoter, and specify the use of a bacterial artificial chromosome (BAC) and an inducible bacterial origin of replication. In contrast, 'Compared' claims detail the use of recombinant viral vectors, specifically Ad5-PRRSV vectors, expressing multiple PRRSV antigens (gp2, gp3, gp4, E, and optionally gp5a/gp5) from a single vector, with a focus on sequence identity to specific SEQ ID NOs. Both sets of claims mention the administration of the vector to subjects, with 'Subject' specifying various administration routes and dosages, while 'Compared' focuses on eliciting a protective response through different administration methods and a prime-boost strategy. The molecular and chemical constituents overlap in the use of viral vectors and the targeting of PRRSV antigens, but the specific approaches and detailed components differ significantly.

-------------------------------------------------------------------------------------------------------------------**Overlap Analysis:**

The overlap between the claims of 'Subject' and 'Compared' is primarily in the use of vectors for PRRSV vaccine development. 'Subject' claims describe a broader approach using a cDNA of an attenuated RNA virus genome, while 'Compared' claims are more specific, focusing on recombinant Ad5-PRRSV vectors expressing multiple PRRSV antigens with high sequence identity to specified sequences. The overlap in molecular constituents is in the use of viral vectors and targeting PRRSV, but the detailed molecular and chemical processes, such as the use of BACs and specific antigen expression, differ. The overlap in context is moderate, as both aim at PRRSV vaccine development but use different methodologies and components.

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**Claims Breakdown and Comparison Summary:
Compared Patent (EP3313864B1) Claim number: 1 and Subject Claim: 6**

The compared claim focuses on a specific recombinant Ad5-PRRSV vector encoding a PRRSV E antigen with high sequence identity to specified sequences, aimed at eliciting an immune response. The subject claim, on the other hand, describes a vector for use in treating or preventing PRRSV infection, which includes a broader viral expression cassette with an attenuated PRRSV genome. Both claims target PRRSV, but the compared claim is more specific to the E antigen and its sequence identity, while the subject claim is more general in its approach to PRRSV treatment/prevention. The scope of the compared claim is narrower, focusing on a particular antigen and its sequence, whereas the subject claim's scope is broader, encompassing any attenuated PRRSV genome for treatment/prevention.

------------------------------------------------------------------------------------------------------------------- **Compared Patent (EP3313864B1) Claim number: 3 and Subject Claim: 6**

The compared claim specifies a recombinant Ad5-PRRSV vector encoding a PRRSV gp2 antigen with high sequence identity to specified sequences, aimed at eliciting an immune response. The subject claim describes a vector for use in treating or preventing PRRSV infection, which includes a broader viral expression cassette with an attenuated PRRSV genome. Both claims target PRRSV, but the compared claim is more specific to the gp2 antigen and its sequence identity, while the subject claim is more general in its approach to PRRSV treatment/prevention. The scope of the compared claim is narrower, focusing on a particular antigen and its sequence, whereas the subject claim's scope is broader, encompassing any attenuated PRRSV genome for treatment/prevention.

------------------------------------------------------------------------------------------------------------------- **Compared Patent (EP3313864B1) Claim number: 4 and Subject Claim: 14**

The compared claim describes a specific immunological or vaccine composition that includes recombinant viral vectors expressing multiple PRRSV antigens (gp2, gp3, gp4, E, and optionally gp5a/gp5) from a single vector, along with a carrier. The subject claim outlines a pharmaceutical composition with a vector containing an attenuated RNA virus genome from the Arteriviridae family, also intended as a vaccine. Both claims focus on compositions for vaccination against PRRSV, but the compared claim is more detailed in specifying the antigens and their expression from a single vector, while the subject claim is broader, focusing on the viral genome and its attenuation. The scope of the compared claim is narrower, targeting specific antigens, whereas the subject claim's scope is broader, encompassing any attenuated Arteriviridae virus genome.

------------------------------------------------------------------------------------------------------------------- **Compared Patent (EP3313864B1) Claim number: 5 and Subject Claim: 6**

The compared claim details a specific recombinant Ad5-PRRSV vector expressing multiple PRRSV antigens for use in eliciting a protective response against PRRSV, with detailed administration methods and options for prime-boost vaccination. The subject claim describes a vector for use in treating or preventing PRRSV infection, which includes a broader viral expression cassette with an attenuated PRRSV genome. Both claims target PRRSV, but the compared claim is more specific in its antigen expression and administration methods, while the subject claim is more general in its approach to PRRSV treatment/prevention. The scope of the compared claim is narrower, focusing on specific antigens and detailed administration methods, whereas the subject claim's scope is broader, encompassing any attenuated PRRSV genome for treatment/prevention.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***Compared file: EP2806891B1**PARAINFLUENZA VIRUS 5 BASED VACCINES
**Inventor: HE BIAO
Assignee: UNIV GEORGIA
Priority Date: 01-24-2012
Publication Date: 04-10-2019
CPC: A61P31/16
IPV™ Rating: 7.0764
Inferred Equivalence: Low**

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The primary function of the invention described under CPC code A61K39/12 is to provide a viral expression vector for use in the prevention of influenza infection. This vector is designed to express influenza antigens, specifically targeting influenza A, B, or C viruses, to induce an immune response in the subject.

-------------------------------------------------------------------------------------------------------------------**Summary of Analysis:**

There is a moderate level of anticipated overlap between the patents due to the general concept of using viral vectors for vaccines. However, the specific molecular and chemical constituents and processes differ significantly. 'Subject' claims involve vectors with an attenuated RNA virus genome from the Arteriviridae family, specifically targeting PRRSV in pigs, while 'Compared' claims involve vectors with a PIV5 genome modified to express influenza hemagglutinin for preventing influenza infections. The differences in the viral families, target diseases, and genetic modifications suggest a low possibility of significant overlap in practical applications. Therefore, while there is a conceptual similarity, the detailed molecular and chemical aspects indicate distinct patent scopes.

-------------------------------------------------------------------------------------------------------------------**Description Overview:**

The core concept of the invention under CPC code A61K39/12 involves the use of a viral expression vector, which may be a PIV5 vector, to deliver and express influenza antigens within a host. The functional principles include the insertion of heterologous nucleotide sequences encoding influenza antigens into specific locations within the PIV5 genome, such as between the hemagglutinin-neuroaminidase (HN) gene and the large RNA polymerase protein (L) gene. This vector can be administered to induce both humoral and cell-mediated immune responses against influenza. Essential components include the viral expression vector itself, the heterologous nucleotide sequences encoding influenza antigens, and potentially mutations within the PIV5 genome to enhance vaccine efficacy. Core interactions involve the expression of the influenza antigens by the host's cellular machinery, leading to the presentation of these antigens to the immune system. Internal dynamics include the replication and expression of the vector within the host cells, which is crucial for the sustained immune response.

-------------------------------------------------------------------------------------------------------------------**Asserted Novelty and Innovation:**

The invention under CPC code A61P31/16 focuses on a vector specifically designed for PRRSV, which is a virus from the Arteriviridae family, and targets pigs. This is distinct from the invention under CPC code A61K39/12, which targets influenza viruses in humans or animals. The novel aspect of the subject invention lies in its use of an attenuated PRRSV genome within a vector to induce immunity against PRRSV, which is not addressed by the compared invention. There is no overlap in the molecular or chemical constituents and processes between the two inventions, as they target different viruses and use different vectors. The subject invention's use of a bacterial artificial chromosome (BAC) as a vector and its focus on PRRSV in pigs further differentiate it from the compared invention's use of a PIV5 vector for influenza.

-------------------------------------------------------------------------------------------------------------------**Similarities Analysis:**

The claims from 'Subject' and 'Compared' both involve viral expression vectors for use in medical applications, specifically for vaccines or prevention of infections. The 'Subject' claims focus on vectors containing a cDNA of an attenuated RNA virus genome from the Arteriviridae family, particularly targeting PRRSV for use in pigs. In contrast, the 'Compared' claims focus on vectors with a PIV5 genome modified to express influenza hemagglutinin for preventing influenza infections. Both sets of claims mention the use of viral expression cassettes and the modification of viral genomes for therapeutic purposes. However, the molecular and chemical constituents differ significantly: 'Subject' involves Arteriviridae viruses and PRRSV, while 'Compared' involves PIV5 and influenza viruses. The processes described also differ, with 'Subject' focusing on bacterial artificial chromosomes and inducible replication origins, and 'Compared' detailing specific gene insertions and mutations in the PIV5 genome.

-------------------------------------------------------------------------------------------------------------------**Overlap Analysis:**

The overlap between the claims of 'Subject' and 'Compared' is primarily in the concept of using viral vectors for medical applications, specifically vaccines. However, the specific viruses, target diseases, and molecular modifications are distinct. 'Subject' focuses on Arteriviridae and PRRSV, while 'Compared' focuses on PIV5 and influenza. The claim\_score of 7.0764 suggests a potential for overlap, but the differences in viral families, target diseases, and genetic modifications indicate that the overlap is moderate at best. The detailed molecular and chemical constituents and processes described in each set of claims further highlight the differences, leading to a moderate level of overlap.

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**Claims Breakdown and Comparison Summary:**

Didn't find any similar subject claim for the threshold used

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***Compared file: US10751407B2**PRRSV minor protein-containing recombinant viral vectors and methods of making and use thereof
**Inventor: MEBATSION TESHOME
Assignee: BOEHRINGER INGELHEIM ANIMAL HEALTH USA INC
Priority Date: 06-23-2015
Publication Date: 08-25-2020
CPC: A61K39/12
IPV™ Rating: 7.0763
Inferred Equivalence: Low**

[Lens: https://www.lens.org/lens/patent/014-599-062-411-086/frontpage?l=en](https://www.lens.org/lens/patent/014-599-062-411-086/frontpage?l=en)

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The primary function of the Compared invention is to provide a safe and effective immunological or vaccine composition for protecting animals, particularly pigs, from Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) infection. This is achieved through the use of one or more recombinant viral vectors, such as adenovirus 5 (Ad5), baculovirus, porcine cytomegalovirus, or poxvirus, which encode retargeted PRRSV antigens (gp2, gp3, gp4) to elicit a broad immune response including humoral, cellular, and mucosal immunity.

-------------------------------------------------------------------------------------------------------------------**Summary of Analysis:**

There is a medium possibility of overlap between the 'Subject' and 'Compared' claims, primarily due to the shared focus on PRRSV vaccines using vectors. However, the molecular and chemical constituents and processes differ significantly. 'Subject' claims involve a vector with a cDNA of an attenuated PRRSV genome, potentially used as a whole virus vaccine, while 'Compared' claims target specific retargeted PRRSV antigens (gp2, gp3, gp4) for a more focused immunological response. Both mention administration to pigs, but 'Subject' provides a broader range of administration methods and specifies dosage, whereas 'Compared' focuses on specific antigen modifications and different administration methods. The overall anticipated overlap of the patent is moderate, with the key difference lying in the molecular approach to the vaccine development.

-------------------------------------------------------------------------------------------------------------------**Description Overview:**

The core concept of the Compared invention involves the use of recombinant viral vectors to express retargeted PRRSV antigens. These vectors are engineered to replace the existing cellular localization sequence of the PRRSV antigens with a cell-surface expression determinant sequence from a heterologous gene, thereby enhancing the antigen's exposure to the immune system. The functional principles include the systemic delivery of these vectors to induce a protective immune response. The underlying functions involve the expression of PRRSV antigens from the vectors, which are then processed by the host's immune system to generate both humoral and cellular immunity. Essential components include the recombinant vectors themselves, the retargeted PRRSV antigens (gp2, gp3, gp4), and a pharmaceutically or veterinarily acceptable carrier. Core interactions occur between the expressed antigens and the host's immune cells, leading to the development of specific immune responses. The internal dynamics involve the replication and expression of the vector within the host cells, followed by the presentation of antigens to stimulate an immune response. No specific molecular or chemical constituents or processes beyond the described genetic engineering and immune response mechanisms are detailed in the patent. No Genbank or Accession numbers are mentioned.

-------------------------------------------------------------------------------------------------------------------**Asserted Novelty and Innovation:**

The Subject invention introduces a novel approach by using a vector with a cDNA of an attenuated PRRSV genome, which is distinct from the Compared invention's use of recombinant viral vectors expressing retargeted PRRSV antigens. The Subject invention's vector does not require the retargeting of antigens, instead relying on the direct expression of the attenuated virus genome to induce immunity. This approach potentially offers a broader immune response due to the expression of the entire attenuated genome, which may include additional viral proteins not targeted in the Compared invention. The Subject invention also claims a lack of increase in rectal temperature post-challenge, suggesting a safer profile compared to existing vaccines like Progressis®. The overlap between the two inventions lies in their aim to combat PRRSV infection through vaccination, but the Subject invention's use of an attenuated whole genome approach represents a significant departure from the antigen-specific targeting of the Compared invention.

-------------------------------------------------------------------------------------------------------------------**Similarities Analysis:**

The claims from 'Subject' and 'Compared' both focus on vectors used in the context of vaccines or immunological compositions against PRRSV, a virus from the family Arteriviridae. 'Subject' claims describe a vector comprising a viral expression cassette with a cDNA of an attenuated RNA virus genome, specifically mentioning PRRSV, and its use as a medicament or vaccine. The vector can be a bacterial artificial chromosome (BAC) and includes an inducible bacterial origin of replication. The administration methods and dosage regimes are also detailed. On the other hand, 'Compared' claims focus on a composition comprising recombinant viral vectors encoding retargeted PRRSV antigens (gp2, gp3, gp4), specifically using vectors like Ad5-PRRSV, and their use in eliciting a protective response in porcine animals. The overlap in context is evident as both sets of claims deal with vectors for PRRSV vaccines, but the molecular and chemical constituents differ. 'Subject' focuses on the entire attenuated virus genome, while 'Compared' targets specific antigens with retargeting modifications. Both mention the use of vectors in pigs, but 'Subject' includes a broader range of administration methods and specifies dosage, whereas 'Compared' focuses on specific antigen modifications and administration methods like oro-nasal and intramuscular.

-------------------------------------------------------------------------------------------------------------------**Overlap Analysis:**

The overlap between 'Subject' and 'Compared' claims is primarily in the use of vectors for PRRSV vaccines. 'Subject' claims mention a vector with a cDNA of an attenuated PRRSV genome, while 'Compared' claims focus on vectors encoding specific retargeted PRRSV antigens. The overlap is moderate as both address PRRSV vaccines but differ in the molecular approach; 'Subject' uses the whole attenuated virus genome, and 'Compared' uses specific retargeted antigens. Both sets of claims mention the use in pigs, but the detailed molecular constituents and processes differ significantly. The overlap is not strong due to these differences in molecular focus.

-------------------------------------------------------------------------------------------------------------------**Sequence Data:**Sequence Count: 139
Sequence Types: P, N
Organisms: 'Porcine reproductive and respiratory syndrome virus', 'PRRSV VR2332', 'Unknown/Artificial'
Bucket: NT\_5001\_100000, NT\_1\_100, AA\_51\_300, AA\_1\_50, NT\_101\_5000

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**Claims Breakdown and Comparison Summary:**

Didn't find any similar subject claim for the threshold used

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